

**Ministry of Health of the Republic of Belarus  
Education Institution  
"Gomel State Medical University"**

Department of Pediatrics with the course of the Faculty of Advanced Training and Retraining

Author:

*T.E. Bubnevich, assistant*

*I.V. Belomytseva, assistant*

**METHODOLOGICAL GUIDELINES**

for a practical exercise  
by a teacher with students  
6th year of the Faculty of foreign students,  
trainees in speciality 1-790101 in the discipline of pediatrics

**Topic: Leukaemia. Haemorrhagic syndrome.**

Time: 7 hours

Approved at the meeting of the Department of Pediatrics with the Course of the Faculty of Advanced Training and Retraining  
(protocol №. 8 of the 14<sup>th</sup> of June 2022)

2022

## **LEARNING AND EDUCATIONAL OBJECTIVES, TASKS, MOTIVATION FOR LEARNING THE TOPIC**

### **Educational objective:**

- Formation of students' basic professional competence while studying the discipline of Pediatrics according to the curriculum
- Shaping of students' knowledge in diagnostics and differential diagnostics of leucosis and hemorrhagic diathesis, examination and rehabilitation of children and teenagers with the given pathology; perspectives for application of received knowledge in professional activity; abilities and skills necessary for work with patients of different age.

### **Educational objective:**

- Fostering in the students the sense of professional responsibility of the future medical worker;
- formation of professionally significant and socially-psychological qualities of the doctor's personality in the system of doctor-nurse-patient relations;
- formation of students' responsible attitude to their future professional activity.
- Formation of academic and work discipline, discussion of disciplinary issues (attendance of lectures and practical classes, unexcused absences, tardiness, debts on missed classes).

### **Objectives:**

As a result of the training session the student should

#### **know:**

- Anatomical and physiological features of the hematopoietic system.
- etiopathogenesis of acute leukaemia, haemorrhagic diathesis;
- Diagnostic criteria for acute leukaemia, haemorrhagic diathesis;
- necessary volume of laboratory tests for diagnostics of hemoblastosis, hemorrhagic diathesis;
- Principles of therapy of acute leukemia, hemorrhagic diathesis;
- Dispensary monitoring of children with acute leukemia, haemorrhagic diathesis.

#### **be able to:**

- by the method of careful collection of anamnesis, selection of information from the history of development to establish the connection of the identified changes with the occurrence of acute leukemia, hemorrhagic diathesis;
- objectively assess the condition of the hematopoietic system and identify the main symptoms of its damage;
- determine the group of nosologies for differential diagnosis;
- build a plan of examination of a patient with acute leukaemia, haemorrhagic diathesis (clinical, laboratory, instrumental);
- interpret the results of the examination, establish their natural correlation;
- prescribe treatment for a patient with acute leukaemia, haemorrhagic diathesis.

#### **know:**

- methods of objective (palpation, percussion, auscultation) and additional (measuring, laboratory, instrumental, histological, immunological, etc.) examination
- communication skills with patients of different ages and their parents, medical personnel.

### **Motivation for learning the topic:**

As part of the educational process of this discipline, the student must acquire not only theoretical knowledge, practical skills and abilities in the specialty, but also develop his value-personal, spiritual potential, be ready to actively participate in industrial, socio-cultural and public life.

### **MATERIAL EQUIPMENT**

Tables on the theme of the lesson, history of hospital patients, set of hemograms, hemostasiogram, biochemical blood tests, myelogram, urine tests, electrocardiograms, X-rays; a bank of tasks for independent work; selection of case studies of patients in the hospital departments.

### **CONTROL QUESTIONS FROM RELATED DISCIPLINES**

1. "Human Anatomy":
  - Human circulatory system.
2. "Normal Physiology":
  - Functioning of the hematopoietic system;
  - Interpretation of normal haemograms from an age perspective.
3. "Pathological anatomy":
  - Morphology of diseases of the blood system.
4. "Pathological Physiology":
  - Disorders of haemopoiesis in iron, protein, vitamin, micronutrient deficiencies.
5. "Propaedeutics":
  - Anatomical and physiological features of hematopoiesis in children;
  - Semiotics of blood diseases in children.
6. "Biological Chemistry":
  - The role of iron, protein, trace elements and vitamins in haemopoiesis.
7. "Pharmacology":
  - Principles of pharmacodynamics and pharmacokinetics of drugs.
  - Factors determining the therapeutic efficacy, side effects and toxicity of drugs.

### **CONTROL QUESTIONS ON THE TOPIC OF THE CLASS.**

1. Leukemia: etiopathogenesis, classification.
2. Differential diagnostics of acute lymphoblastic leukemia and chronic myeloleukemia (clinical manifestations, haemogram and myelogram parameters). Prognosis.
3. Strategy and principles of therapy of acute lymphoblastic leukemia.
4. Causes of bleeding and hemorrhagic syndromes in children. Diagnostic and treatment algorithm of bleeding in children (nasal, digestive tract, pulmonary, urinary tract).
- 5.

5. Differential diagnosis of hemorrhagic syndrome in hemophilia, thrombocytopenic purpura, DIC syndrome. Emergency care.
6. Dispensary examination of children with diseases of the blood system.

## **PROCESS OF THE SESSION**

### **Theoretical part**

Haemoblastosis is one of the most severe and frequent tumour diseases in children. They are malignant neoplasms whose substrate is cells of hematopoietic tissue.

Haemoblastoses are tumour diseases (neoplastic diseases) of the hematopoietic and lymphatic tissue. Haemoblastoses are subdivided into systemic diseases called leukaemia and regional diseases called lymphoma. The difference between leukaemia and lymphoma lies not only in the presence or absence of systemic disease. In the terminal stage, lymphomas metastasize extensively, including to the bone marrow. However, in leukaemia, the bone marrow is primarily affected, whereas in lymphoma it is metastasised secondarily.

The study of this pathology is very important, since various endogenous and exogenous factors, including drugs, may contribute to the development of this group of diseases.

Hemorrhagic diathesis - a group of congenital and acquired diseases and syndromes, the leading clinical manifestation of which is pathological bleeding. A total of over 300 hemorrhagic diatheses are described in the literature. The pathology is based on quantitative or qualitative defects of one or more blood-clotting factors. The degree of bleeding can range from small petechial eruptions to large haematomas, massive external and internal bleeding.

It is estimated that about 5 million people worldwide suffer from primary haemorrhagic diathesis. When secondary hemorrhagic conditions (e.g. DIC syndrome) are taken into account, the prevalence of haemorrhagic diathesis is truly high. The problem of complications, connected with hemorrhagic diathesis, is in the attention of different medical specialities - hematology, surgery, intensive care medicine, traumatology, obstetrics and gynecology and many others.[3]

### **Practical part**

The students are briefed on the organisation of the structural unit. Patients are selected in accordance with the topic of the class.

During the practical work the student should carry out:

- collection of complaints and anamnesis of the disease,
- clinical examination of the child,
- make a preliminary diagnosis and develop an examination plan,
- Interpret the results of the laboratory and instrumental methods of investigation,
- Formulation of the final clinical diagnosis,
- Formulation of a treatment and rehabilitation plan,
- writing prescriptions for medicines.

### **Monitoring the learning of the topic**

**1. Demonstration of case studies with analysis of clinical cases (medical records):**

- acute lymphoblastic leukaemia,
- hemorrhagic vasculitis,
- idiopathic thrombocytopenic purpura,
- hemophilia,
- thrombocytopathies.

**2. Decipher proposed haemograms of children of different ages with leukaemia and haemorrhagic diathesis.**

**3. Solution of situational tasks**

**Task 1.**

A 4-year-old girl is admitted to the clinic with complaints of abdominal pain, headache, general weakness, poor appetite. She has been ill for 2 months. A week ago her skin became pale, she had runny nose, cough, body temperature increased to 39°C. Penicillin was prescribed.

On admission his condition was serious. High fever and body temperature - 39 C. Skin was pale with grayish-ground tinge. Extensive haemorrhages on the buttocks, in the injection sites. On the mucosa of the soft palate, on the palatine tonsils there are necrotic plaques. Anteroposterior, submandibular, axillary and inguinal lymph nodes measuring 1.5 cm by 1.5 cm are palpable. On auscultation of the heart there was systolic murmur at the apex, tachycardia, heart rate 162 per min. The liver +2 cm from under the edge of the rib cusp, spleen + 4 cm. On palpation the liver and spleen are dense, painless, their edges are smooth.

Blood count: Er. -  $2.9 \times 10^{12}/l$ , Hb - 78 g/l, L -  $4.6 \times 10^9/l$ , blasts - 10%, n - 6%, c - 5%, l - 79%, sed rate - 74 mm/hour, platelets -  $27 \times 10^9/l$ .

Myelogram: blast cells 86%, promyelocytes 1%, myelocytes 2%, lymphocytes 9%, normoblasts 2%. Reaction for peroxidase, lipids - negative, for glycogen - positive.

Assignment:

1. Formulate a preliminary diagnosis and make a differential diagnosis.
2. Identify the leading syndromes of the disease.
3. Prescribe therapy for the period of in-patient treatment.
4. Prescribe rehabilitation measures at the outpatient clinic.

**Task 2.**

A 7-year-old boy has been admitted to the hospital with complaints of bleeding from the oral cavity.

The anamnesis revealed that the child had a massive bleeding from a damaged frenulum of the upper lip at the age of two years.

Objectively, the child was pale and lethargic. There was moderate bleeding from the gingiva of the third milk tooth on the lower jaw, the tooth had a deep carious cavity, which injured the gingival mucosa with its sharp edges. Peripheral lymph nodes are not enlarged. Heart tones are rhythmic, soft systolic murmur above the apex and at the 5th point. The abdomen is soft and painless on palpation. The liver and spleen are not palpable.

The clinical blood count was 77 g/l, E -  $2.5.0 \times 10^{12}/l$ , CP - 0.9, L -  $7.0 \times 10^9/l$ , E - 2%, P - 5%, S - 59%, L - 25%, M - 9%, SLE - 15 mm/hour, platelets -  $270.0 \times 10^9/l$ .

Time of clotting according to Lee-White - 30 min. Duke bleeding time - 4 min. Activity of factor 8 less than 5%.

Task:

1. Formulate a clinical diagnosis.
2. Plan for the examination of the patient.
3. the treatment strategy for the patient.

Task 3.

A 10-year-old girl had been suffering from frequent nosebleeds and occasional skin bruises for the last 5 years. She felt well and had not consulted any doctors. A fortnight ago, after a heavy nosebleed, weakness and dizziness occurred.

Examination: Moderate condition, pale skin, multiple haemorrhagic petechial rashes and extensive single ecchymoses on the skin of the chest and legs. Heart rate - 96 per 1 min, heart tones loud, systolic murmur at the apex. The liver and spleen were not enlarged.

In the clinical blood count: Hb - 90g/l, Ehr. - He had  $3.2 \times 10^{12}/l$ , CP - 0.84, L -  $6.2 \times 10^9/l$ , E - 2%, P - 3%, S - 67%, L - 23%, M - 5%, platelets -  $30 \times 10^9/l$ , sed rate - 15 mm/hour.

Task:

1. Formulate a preliminary diagnosis and justify it.
2. Examination plan.
3. Carry out the differential diagnosis.
4. Prescribe treatment for the patient.

## **GUIDELINES FOR ORGANISING AND CARRYING OUT COURSEWORK**

**The time allocated for independent work is used by students for:**

- Studying the topics (issues) for independent study;
- problem solving;
- research and creative assignments;
- preparing thematic reports, presentations;
- completing practical assignments;
- designing information and demonstration materials (stands, posters, charts, tables, newspapers, etc.);
- compilation of thematic selection of literary sources, internet sources;
- Duty in health care organisations;
- compiling a review of scientific literature on the issues of the class.
- preparation of lectures, discussions with patients on the prevention of blood diseases and the formation of a healthy lifestyle;
- compiling case studies on the topic of the class.

**The main methods for organizing independent work:**

- making a report;
- Examining topics and problems that are not covered in the class;

- preparation and participation in active forms of learning.

The list of SRS tasks:

- Study of clinical guidelines (examination and treatment protocols for children) with blood diseases
  - acute lymphoblastic leukemia,
  - hemorrhagic vasculitis,
  - Idiopathic thrombocytopenic purpura,
  - hemophilia,
  - thrombocytopathies.
- Research paper on the topic of the class.

## **GUIDELINES FOR THE ORGANISATION AND EXECUTION OF COURSEWORK**

**The time allocated for independent work is used by students to**

- Studying topics (questions) for independent study;
- problem solving;
- doing research and creative assignments;
- preparing thematic reports, presentations;
- completing practical assignments;
- design of information and demonstration materials (stands, posters, diagrams, tables, newspapers, etc.);
- making thematic selections of literary sources, internet sources;
- Duty in health care organisations;
- compilation of scientific literature review on the issues of the class.
- preparation of lectures, conversations with patients on the prevention of blood diseases and the formation of a healthy lifestyle;
- case studies on the topic of the class.

**The main methods of organizing independent work:**

- preparing a report;
- examining topics and problems that are not covered in the class;
- preparation and participation in active forms of learning.

**The list of SIW tasks:**

- Study of clinical guidelines (protocols for examination and treatment of children) with blood diseases
  - Acute lymphoblastic leukemia,
  - hemorrhagic vasculitis,
  - Idiopathic thrombocytopenic purpura,
  - hemophilia,
  - thrombocytopathies.
- Research work on the topic of the class.

### **Task 1**

A 10-year-old boy was admitted to the department with nasal bleeding.

He had had an acute respiratory infection 2 weeks before the present illness, after which he had ecchymoses of different sizes and small dot haemorrhagic rashes on different parts of the body, without any localization. A community doctor diagnosed the patient with hemorrhagic vasculitis.

On admission the condition of the child is severe. Examination reveals profuse hemorrhagic syndrome in the form of ecchymoses of varying size and duration, on the face, neck and hands petechial cells. There are blood-soaked swabs in the nasal passages. Peripheral lymph nodes were small and mobile. Cardiopulmonary activity was satisfactory. Abdomen is soft and painless. The liver and spleen are not palpable.

Additional findings:

General blood count: Hb - 101 g/l, R -  $3.2 \times 10^{12}/l$ , Thrombus -  $12 \times 10^9/l$ , Leuk -  $6.4 \times 10^9/l$ , p/l - 2%, s - 59%, e - 3%, l - 28%, m - 8%, sed rate - 5 mm/hr.

Myelogram: bone marrow cellular, blast cells - 2%, neutrophil sprout - 62%, eosinophil sprout - 4%, lymphocytes - 5%, erythroid sprout - 27%, megakaryocytes - 1 per 120 myelokaryocytes, platelet linings were not disrupted.

General analysis of urine; colour - straw-yellow, specific gravity - 1008, protein - none, squamous epithelium - 2-4 in p / s, white blood cells - 2-4 in p / s, red blood cells - none, cylinders - none, mucus - none, bacteria - none.

Task:

1. Formulate a correct diagnosis, justify.
2. Plan the examination of the child.
- 3 Prescribe treatment for this patient.
4. What is the prognosis of the disease?
5. Describe the possible changes in the ocular fundus in this disease.
6. Describe the morphological features of the megakaryocyte.

### **Task 2.**

A 9-year-old boy P. was referred by his local pediatrician. He had rash on his skin and pain in his abdomen and joints. He complains of cramp-like pains in the abdomen, pain in left knee and left ankle joints, small dot reddish rash on lower extremities.

The medical history shows that two weeks ago the boy had a fever of  $38^{\circ}\text{C}$  and a sore throat. The district paediatrician diagnosed lacunar angina and prescribed oxacillin. A week later small dot rash appeared on the skin of the lower extremities, intermittent pain in the left knee joint.

On admission - child's condition is severe. Lethargic, lying in forced posture with knees pressed to the abdomen. On the skin of the lower extremities, buttocks and earlobes there was a small dotted, in some places confluent reddish-blue hemorrhagic rash, slightly protruding above the skin surface. The left knee and left ankle joints are swollen, painful on palpation and movement, hot to the touch, with a haemorrhagic rash over them. Abdomen is painful on palpation, liver and spleen are not palpable. Stool is poor, in small portions, mushy, raspberry jelly coloured. Urination was good, the urine was pale.

Additional findings:

General blood count: Hb - 110 g/l, Rhe -  $3.5 \times 10^{12}/l$ , C.P. - 0.9. Blood clot -  $435 \times 10^9/l$ , Leuk -  $10.5 \times 10^9/l$ , young - 1%, p/y - 5%, s - 57%, e - 2%, l - 28%, m - 7%, SLE - 25 mm/hour.

Blood chemistry: total protein - 71 g/l, urea - 3.7 mmol/l, creatinine - 47 mmol/l, total bilirubin - 20.2  $\mu\text{mol}/l$ , AST-25 units, ALT-20 units.



General analysis of urine: colour - straw-yellow, relative density - 1012, no protein, epithelium - 0-1 in p / l, leukocytes -2-4 in p / l, no erythrocytes, no cylinders.

Task:

1. Formulate a correct diagnosis, justify. Explain the pathogenesis of clinical manifestations of the disease in the patient.
2. Plan of examination of the child.
3. List the complications of this disease.
4. Which specialist should be consulted given the clinical picture.
5. Draw up a treatment plan for the patient.
6. Describe the morphological changes in the vessels in this disease.

### **Task 3.**

A 5-year-old boy came to the emergency department for a knee injury. He complained of pain and limitation of movement in the right knee joint, which appeared 2 hours after a fall from a bicycle.

From the anamnesis it is known that since the age of 1 year the boy has had extensive bruises causing subcutaneous haematomas, several times a year there are nosebleeds. At the age of 3 and 4 years old after contusions there was swelling around ankle and elbow joints, pain, limitation of movement in them. All the above injuries required hospitalization and specific therapy.

On admission the child's condition is severe. He complains of pain in the knee joint and cannot step on the leg. Skin is pale and there are large extravasations on the lower extremities and forehead. The right knee joint is enlarged, hot to the touch, painful and limited movement. In the area of the left elbow joint there was limited mobility, slight increase in its volume as a result of trauma at the age of 4 years.

Additional findings:

General blood count: Hb - 100 g/l, Rbc -  $3.0 \times 10^{12}/l$ , Retic - 3%, Thrombus -  $300 \times 10^9/l$ , Leuk -  $8.3 \times 10^9/l$ , p/l - 3%, s - 63%, e - 3%, l - 22%, m -9%, COE-12mm/hr.

Bleeding duration in Duke - 2 min 30 sec.

Time of clotting by Lee-White over 15 min.

Task:

1. Formulate a correct diagnosis and justify the diagnosis.
2. Plan for evaluation of the child.
- 3 Prescribe treatment for this patient.
4. What should be paid attention to when collecting the life history of the child's parents?
5. What is the prognosis of the disease in this patient?
6. Why did the joint pain occur only 2 hours after the injury?

### **Task 4.**

A 12-year-old boy R. was admitted to the department with complaints of weakness, nausea, vomiting, fever, and pain in the legs.

According to his medical history he had been tired out quickly for the last 3 months. Two weeks ago the parents noticed that the child became pale. Real worsening of condition was noticed 10 days ago, when the temperature increased to

39.3°C, submandibular lymph nodes increased. Outpatient blood test showed hyperleukocytosis up to  $200 \times 10^9/l$ , with suspicion of chronic leukemia the boy was hospitalised.

On admission the child's condition is severe. Symptoms of intoxication were pronounced. Skin and visible mucous membranes were pale, numerous ecchymoses on extremities. Submandibular, cervical lymph nodes up to 1.5 cm in size, mobile and painless; axillary and inguinal lymph nodes up to 1.0 cm in diameter were palpated. Breathing in the lungs is vesicular, weakened in the lower right side, no rales are heard. The heart tones are clear and rhythmic. The abdomen is soft, painless on palpation. Liver +4.0 cm, spleen +2.0 cm below the edge of the rib arch. There is stiffness of the occipital muscles, positive Kernig's symptom.

Additional findings:

General blood count: Hb - 86 g/l, R -  $3.2 \times 10^{12}/l$ , Thrombus - singular, Leuk -  $208 \times 10^9/l$ , blasts - 76%, p/a - 1%, c - 4%, l - 19%, COE - 64 mm/hr.

Myelogram: bone marrow hyperplasia, blasts - 96%, neutrophil sprout - 3%, erythroid sprout - 1%, megakaryocytes - not found.

Bone marrow cytochemical examination: SHIK reaction is granular in 95% of the blasts, reaction to myeloperoxidase and sudan is negative.

Immunological study of bone marrow: mature T-cell markers were detected.

Examination of CSF: cytolysis - 200/3, protein - 960 mmol/L, Pandy reaction - +++, blasts - 100%.

Task:

1. Formulate a correct diagnosis and justify it.
2. What is the plan for the examination of the child?
3. state the main steps in the treatment of this condition.
4. What caused the development of neurological symptoms?
5. Explain the pathogenesis of the clinical symptoms.
6. Describe the possible ophthalmological symptoms in this pathology.

#### **Task 5.**

A 12 year old girl. Past medical history: 2nd pregnancy, term birth. Newborn period was normal. From the age of 4 she had exudative diathesis, which was associated with artificial feeding. After the age of 1 year the child occasionally had rash and Quincke's edema after eating eggs, chocolate and oranges. She is often ill with acute respiratory infections. Fifteen days prior to admission to hospital she contracted follicular angina. She was treated with antibiotics and drank a lot, including orange juice. On the 14th day of illness, the child had pain in the ankle joint and a rash on the legs.

Objective examination on admission: There was a profuse exudative-hemorrhagic rash on the shins, thighs, buttocks, symmetrical, more on the extensor surfaces and around the joints. The ankle joints are oedematous. Breathing is vesicular, no rales. Number of breaths 20 per minute. Heart sounds are audible. Pulse 80 per minute. BP 110/60 mm Hg. The abdomen is soft, painful on palpation around the navel, at the point of the gallbladder. Appetite is reduced. Tongue was moist, densely covered with white plaque. The stool was after an enema, clear, with some mucus. Sexual formula: Ma2, P2, A2, Me0.

Data of the examination carried out:

Blood analysis: haem.-126 g/l, er.-4.0x10<sup>12</sup>/l, col.p.-0.95, thromb.-322x10<sup>9</sup>/l, leuk.-7.4x10<sup>9</sup>/l, p.i.-6%,s.i.-64%.eos.-8%, l.-18%.m4%, COE-24 mm/h.

Duck bleeding time 3 min,

Bürger's clotting time: start - 1 min, end - 3 min.

Task:

1. Formulate a diagnosis.
2. What are the clinical syndromes characteristic of this disease?
3. Plan of examination.
4. Treatment plan.
5. What factors might have contributed to the development of the disease?

#### **Task 6.**

An 8-year-old girl. Past medical history: a child of a normal pregnancy. Urgent birth. Child was growing and developing normally. 3-4 times a year had acute respiratory infections. A month before admission, began to complain of abdominal pain and worsened appetite. Temporary fever up to 38-38.5 degrees, no signs of upper respiratory tract catarrh. She did not consult a doctor. In the last days before admission, pain in the right knee joint appeared and the child was admitted to hospital.

Objective examination on admission: Skin was pale with grayish tinge. The mucous membranes were pale. There were single ecchymoses and a non-prevalent petechial rash on the shins and chest. Posterior, submandibular, tonsillar, axillary and inguinal lymph nodes up to 1x2 cm, multiple, mobile, palpable. The lungs had vesicular breathing and no rales. Number of breaths 25 per minute. Tachycardia. Heart tones muffled, systolic murmur at the apex. BP 96/50 mm Hg. The abdomen is soft, moderate painfulness on palpation in the area of the navel. The liver protrudes from under the edge of the rib arch by 3 cm, the spleen by 2 cm. Urination was free.

Data from the examination:

Blood: Hemoglobin -89 g/l, er.-2.5 x10<sup>12</sup>/l, c.p.-0.9, platelets-15x10<sup>9</sup> /l, leuk.- 42.0 x10<sup>9</sup> /l, blasts-98%, lymph. - 2%, COE-29 mm / hr.

Task:

1. Formulate a diagnosis.
2. Plan for further investigation.
3. Plan of treatment.
- 4, With which diseases should the differential diagnosis be made according to the clinical picture?

#### **2. test control**

1. Which forms of leukaemia are most common in children?
  1. acute lymphoblastic;
  2. acute myeloblastic;
  3. acute monoblastic.
2. The pathogenesis of leukemia is based on:
  1. tumour cell transformation and suppression of normal hematopoiesis sprouts;
  2. reactive changes in the bone marrow;

3. occurrence of immune antigen + antibody complexes.
3. Acute leukemia in the general blood count is characterized by:
  1. anemia;
  2. thrombocytopenia;
  3. leukemic failure;
  4. leukopenia or leukocytosis;
  5. all of the above.
4. For acute leukemia, the characteristic type of bleeding is:
  1. petechial-stained;
  2. haematomic;
  3. microangiomatous.
5. The division of leukaemia into acute and chronic is based on:
  1. the morphological substrate of the tumour;
  2. duration of the disease;
  3. presence of extranodular tumour foci.
6. What tests should be performed on a patient with acute leukaemia before the initiation of therapy?
  1. Bone marrow puncture;
  2. Bone marrow puncture, immunophenotyping and cytochemical reactions;
  3. Bone marrow puncture and ultrasound examination of the internal organs.
7. Does acute leukemia progress to chronic leukemia:
  1. yes;
  2. no.
8. At what stage of leukaemia is the diagnosis made:
  1. in the period of flare-up;
  2. during remission;
  3. in the terminal stage.
9. Which clinical syndrome is the major one in acute lymphoblastic leukaemia?
  1. hyperplastic;
  2. intoxicating; 2;
  3. haemorrhagic; 4;
  4. anemic.
10. Which drug is used in the treatment of acute lymphoblastic leukaemia:
  1. l-asparaginase;
  2. vincristine;
  3. high-dose methotrexate;
  4. cytarabine (cytosar);
  5. all of the above.
11. For how many years is anti-leukemia therapy for acute lymphoblastic leukemia:
  1. 5;
  2. 10;
  3. 1. year;

4. 2. 2 years;
5. 3. 3 years.
12. Name the main side effect of rubomycin:
  1. allergic reactions;
  2. myelodepression;
  3. toxic effects on hepatocytes;
  4. toxic effects on the heart muscle.
13. Name the main side effect of L-asparaginase:
  1. allergic reactions;
  2. myelodepression;
  3. toxic effects on hepatocytes;
    4. toxic effects on the heart muscle;
    5. toxic effects on the pancreas.
14. What is the main criterion in the haemogram for the diagnosis of chronic myeloleukemia:
  1. lymphocytosis;
  2. marked leucocytosis;
  3. eosinophilia;
  4. basophilic-eosinophilic association.
15. Which of the following serves to confirm the diagnosis of acute leukemia in children:
  1. enlarged lymph nodes;
  2. hemorrhagic manifestations;
  3. Hepato- and splenomegaly;
  4. combination of anemia, thrombocytopenia and leukopenia in the general blood count;
  5. detection of leukaemic cells in a blood smear (myelogram).
16. Which indicator can distinguish lympho-leukaemia from myeloleukaemia:
  1. hyperleukocytosis;
  2. percentage of blasts in the myelogram;
  3. thrombocytopenia;
  4. peroxidase reaction.
17. Which symptom is seen in chronic lympholeukemia:
  1. erythrocytosis;
  2. lymphadenopathy;
  3. presence of myelocytes, metamyelocytes in peripheral blood;
  4. hyperthrombocytosis;
  5. elevated serum levels of vitamin B12.
18. A 7-year-old girl has bone pain, hemorrhagic manifestations on the skin of the shins, and hepatosplenomegaly for 3 months. Your presumptive diagnosis:
  1. Lymphogranulomatosis;
  2. acute leukemia;

3. yersinosis;
4. hypoplastic anemia.
19. What type of bleeding is characteristic of DIC syndrome?
  1. Haematomic
  2. Petechial-stained
  3. Mixed bruise and haematoma
  4. Vasculitic-purulent
  5. Angiomatous
20. What type of bleeding is characteristic of haemorrhagic vasculitis?
  1. Haematomic
  2. Petechial-stained
  3. Mixed bruise and haematoma
  4. Vasculitic-purulent
  5. Angiomatous
21. What type of bleeding is characteristic of a giant haemangioma?
  1. Haematoma
  2. Petechial-stained
  3. Mixed bruise and haematoma
  4. Vasculitic-purulent
  5. Angiomatous
22. If plasma tolerance to heparin is 5 minutes, the patient should be given:
  1. Heparin
  2. Fresh frozen plasma
  3. Cryoprecipitate
  4. Protamine sulphate
  5. Calcium preparations
23. Vitamin-K dependent clotting factors are:
  1. factor 8.
  2. factor 11.
  3. 12 factor
  4. All of the above
  5. None of the above
24. Patients with microcirculatory disorders are prescribed heparin for:
  6. Thrombocytes less than 80,000.
  7. Haemoglobin more than 70 g/l
  8. Hematocrit count over 40
  9. Blood pressure below 100 mmHg.
25. In Willebrandt's disease there is a deficiency in:
  1. Prothrombin
  2. Fibrinogen
  3. Factor 7.
  4. factor 8.

5. factor 9.
26. Baby on day 2 of life has umbilical haemorrhage, melena, microhaematuria. What is the most likely diagnosis?
  1. Congenital leukemia
  2. Haemorrhagic neonatal disease
  3. Haemophilia A
  4. Haemorrhagic vasculitis
27. Hemorrhagic vasculitis is characterized by:
  1. Haemorrhage in the joints
  2. Positive pinch, tourniquet, hammerhead symptom
  3. Intramuscular haematomas
  4. thrombocytopenia
28. Which function do platelets not perform in haemostasis?
  1. angiotrophic
  2. adhesive-aggregative
  3. Causes vasospasm.
  4. Involve in blood clotting
  5. Activate fibrinolysis.
  6. Cause retraction of the blood clot
29. Hemorrhagic vasculitis is characterized by:
  1. 15 min Lee-White clotting
  2. Bleeding duration 10 min.
  3. Platelet count 30 thous.
  4. Leukocytosis, eosinophilia
  5. Lack of retraction of the blood clot
30. Is joint involvement characteristic of haemorrhagic vasculitis?
  1. Yes
  2. No
31. State the characteristic manifestations of haemorrhagic vasculitis:
  1. Symmetrical red rash in the form of spots and papules on the extensor surface of the joints
  2. Petit-point haemorrhages all over the body, abdominal cramping and pain
  3. Subcutaneous and intramuscular haematomas
  4. Persistent bleeding from minor injuries
32. Select from the following laboratory signs of stage 3 DIC syndrome:
  1. platelets of 150,000.
  2. Clotting time 20 seconds.
  3. Prothrombin index 1.1
  4. Fibrinogen B +++
  5. ethanol test +
33. Which of the following drugs are contraindicated in stage 3 DIC syndrome:
  1. Heparin

2. Dicinone
3. ascorbic acid
- Trental.
5. Complamin
6. Contrical
7. Aspirin
34. Choose the drugs that are appropriate for the treatment of stage 2 DIC syndrome:
  1. Vicasol, calcium gluconate
  2. Reopolyglucin, glucose with cocarboxylase
35. The initiation of the thrombosis process is associated with:
  1. Hemolysis of erythrocytes
  2. Increase in the sedimentation rate
  3. platelet agglutination
  4. Conversion of fibrinogen to fibrin
  5. Marginal leukocyte proliferation
36. Which abnormalities are not characteristic of DIC syndrome?
  1. Haemarthrosis
  2. Haemorrhagic manifestations
  3. disorders of blood clot retraction
  4. Hypofibrinogenemia
37. A 10-month-old child presents with extensive bruising of the buttocks during a fall. State the most likely diagnosis:
  1. Haemorrhagic vasculitis.
  2. thrombocytopathy
  3. thrombocytopenia
  4. Vasopathy
  5. Haemophilia
38. Which agglutinins are found in serum O(1)?
  1. Serum contains agglutinin "a"
  2. Serum contains agglutinin "b".
  3. Serum contains both agglutinins.
  4. Serum contains no agglutinins
39. What function do platelets not perform in haemostasis?
  1. angiotrophic
  2. adhesive-aggregative
  3. Causes vasospasm.
  4. Involve in blood clotting
  5. Activate fibrinolysis.
  6. Cause retraction of the blood clot
40. What type of bleeding is characteristic of thrombocytopenia?



1. Haematoma
2. Petechial-stained
3. Mixed bruise and haematoma
4. Vasculitic-purulent
5. Angiomatous
41. What is the characteristic type of purpura in thrombocytopenia?
  1. Symmetrical rashes
  2. Rashes around the joints
  3. Petechial rash
4. Disorderly haemorrhages
42. State the most effective treatment for idiopathic thrombocytopenic purpura:
  1. Splenectomy
  2. Cryoprecipitate .
  3. Prednisolone
  4. immunoglobulin infusion
43. Idiopathic thrombocytopenic purpura is characterized by:
  1. Haemorrhages in the joints
  2. Uterine bleeding
  3. Haematuria
  4. Intramuscular haematomas
44. Idiopathic thrombocytopenic purpura is characterized by:
  1. 15 min Lee-White clotting
  2. Bleeding duration 10 min.
  3. Platelet count 30 thousand, No retraction of the blood clot
4. Leucocytosis, eosinophilia
45. State the characteristic manifestations of thrombocytopenic purpura:
  1. Symmetrical red rash in the form of spots and papules on the extensor surface of the joints
  2. Bruising and fine haemorrhages all over the body
  3. Subcutaneous and intramuscular haematomas
  4. Persistent bleeding from minor injuries
5. Abdominal cramping and pain
46. Which of the following drugs should not be given to a child with thrombocytopenic purpura?
  1. analgin
  2. Carbenicillin
3. Penicillin
47. Which antibiotic should not be prescribed for thrombocytopathies?
  1. Penicillin
  2. erythromycin
  3. Ceporin
  4. Ristomycin

48. Which test is more appropriate in thrombocytopathy?
  1. biochemical blood test
  2. coagulogram study
  3. blood clot retraction test
  4. prothrombin and fibrinogen determination
49. Is painful bleeding into the skin and mucous membranes typical of thrombocytopenia:
  1. painful
  2. painless
50. What level of platelet reduction with preserved platelet function can give bleeding:
  1.  $120-140 \times 10^9/l$
  2.  $90-120 \times 10^9/l$
  3.  $50-80 \times 10^9/l$
  4.  $30 \times 10^9/l$
51. Which haemorrhage is most characteristic of primary haemostasis disorders;
  1. uterine, gastrointestinal
  2. into large joints
  3. into muscles
  4. nasal, gingival
52. Which surgeries are most dangerous for patients with microcirculatory hemostasis disorders in terms of bleeding:
  1. tooth extraction
  2. tonsillectomy
  3. abdominal surgery
  4. all types of operation

Answers: 1 - 1; 2 - 1; 3 - 5; 4 - 1; 5 - 1; 6 - 2; 7 - 2; 8 - 1; 9 - 1; 10 - 5; 11 - 4; 12 - 4; 13 - 5; 14 - 4; 15 - 5; 16 - 4; 17 - 2; 18 - 2; 19 - 3; 20 - 4; 21 - 5; 22 - 2; 23 - 5; 24 - 3; 25 - 4; 26 - 2; 27 - 2; 28 - 5; 29 - 4; 30 - 1; 31 - 2; 32 - 2; 33 - 5; 34 - 2; 35 - 3; 36 - 1; 37 - 5; 38 - 3; 39 - 5; 40 - 2; 41 - 4; 42 - 3; 43 - 2; 44 - 3; 45 - 2; 46 - 2; 47 - 4; 48 - 3; 49 - 2; 50 - 4; 51 - 4; 52 - 2.

### **Forms of GSSS performance monitoring:**

1. checking and evaluating the correctness of solving situational tasks;
2. test control.

### **LIST OF REFERENCES**

1. Шабалов, Н. П. Детские болезни : учебник : в 2 т. — СПб : Питер, 2021. — Т. 1. — 880 с. — Режим доступа: <https://docplayer.com/215163401->

[Shabalov-n-p-sh12-detskie-bolezni-uchebnik-dlya-vuzov-tom-1-8-e-izd-spb-piter-s-il-seriya-uchebnik-dlya-vuzov.html](http://Shabalov-n-p-sh12-detskie-bolezni-uchebnik-dlya-vuzov-tom-1-8-e-izd-spb-piter-s-il-seriya-uchebnik-dlya-vuzov.html) – Дата доступа: 28.05.2022.

2. Шабалов, Н. П. Детские болезни : учебник : в 2 т. – СПб : Питер, 2021. – Т. 2. – 896 с. – Режим доступа: <https://docplayer.com/215163401-Shabalov-n-p-sh12-detskie-bolezni-uchebnik-dlya-vuzov-tom-1-8-e-izd-spb-piter-s-il-seriya-uchebnik-dlya-vuzov.html> – Дата доступа: 28.05.2022.

3. Педиатрия = Pediatrics : учебник для иностр. студентов учреждений высш. образования по специальности "Лечеб. дело" / Н. С. Парамонова [и др.]. – Минск : Новое знание, 2021. – 597, [1] с.

4. Альферович, Е. Н. Анемии у новорожденных детей : учеб.-метод. пособие / Е. Н. Альферович, Л. В. Грак ; Белорус. гос. мед. ун-т, 2-я каф. детских болезней. – Минск : БГМУ, 2021. – 21, [1] с. (НЛ) <http://rep.bsmu.by/bitstream/handle/BSMU/31512/978-985-21-0723-5.Image.Marked.pdf?sequence=1&isAllowed=y> – Дата доступа: 28.05.2022.

5. Асирян, Е. Г. Клинико-иммунологическое обоснование применения иммунокорректирующего лечения у детей с бронхиальной астмой : монография / Е. Г. Асирян : УО «Витеб. гос. мед. уни-т», каф. Педиатрии. – Витебск : ВГМУ, 2018. – 242 с. : ил., табл. – Библиогр. : с.209-242. – Режим доступа: [https://www.elib.vsmu.by/bitstream/123/20717/1/Asirian-EG\\_Kliniko-immunologicheskoe\\_obosnovanie\\_primeneniia\\_immunokorrigiruiushchego\\_1\\_echeniia\\_u\\_detej\\_s\\_bronkhial%27noj\\_astmoj\\_2018.pdf](https://www.elib.vsmu.by/bitstream/123/20717/1/Asirian-EG_Kliniko-immunologicheskoe_obosnovanie_primeneniia_immunokorrigiruiushchego_1_echeniia_u_detej_s_bronkhial%27noj_astmoj_2018.pdf) – Дата доступа: 28.05.2022.

6. Вёрткин, А. Л. Неотложная медицинская помощь на догоспитальном этапе [Электронный ресурс] : учебник / А. Л. Вёрткин, Л. А. Алексанян, М. В. Балабанова и др. ; под ред. А. Л. Вёрткина. - М. : ГЭОТАР-Медиа, 2016. - 544 с. – ISBN 978-5-9704-3579-3 – Режим доступа: <http://www.studmedlib.ru/book/ISBN9785970435793.html> – Дата доступа: 28.05.2022.

7. Кильдиярова, Р. Р. Физикальное обследование ребенка [Электронный ресурс] : учеб. пособие / Р. Р. Кильдиярова, Ю. Ф. Лобанов, Т. И. Легонькова – М. : ГЭОТАР-Медиа, 2015. – 256 с. – ISBN 978-5-9704-3243-3 – Режим доступа: <https://www.rosmedlib.ru/ru/book/ISBN9785970432433.html> – Дата доступа: 28.05.2022.

8. Курат, Ш. Неотложные состояния в педиатрии : пер. с англ. / Ш. Курат, Б. Реш. – М. : Медицинская литература, 2018. – 264 с.

9. Неотложная помощь в педиатрии : пособие для студентов учреждений высш. образования, обучающихся по специальности 1-79 01 01 «Лечеб. дело» / М-во здравоохранения Респ. Беларусь, УО «Витеб. Гос. Мед. ун-т», каф. Педиатрии ; под ред И.М. Лысенко. – Витебск : Изд-во ВГМУ, 2018. – 298 с : табл. – Рек. УМО по высш. мед. образованию Респ.

Беларусь. – Режим доступа: <https://elib.vsmu.by/handle/123/20179> – Дата доступа: 28.05.2022.

10. Пропедевтика детских болезней : учебное пособие для студентов учреждений высш. образования по специальности «Педиатрия» / под ред. М. В. Чичко, А. М. Чичко. – Минск : Мисанта, 2018. – 911 с. : ил., табл. + 1 электрон. Опт. Диск (CD-ROM). – Допущено М-вом образования Респ. Беларусь.

11. Таточенко, В. К. Болезни органов дыхания у детей / В. Т. Таточенко. – М., 2015. – 396 с. – Режим доступа: [https://www.studmed.ru/rachinskiy-sv-tatochenko-vk-bolezni-organov-dyhaniya-u-detey\\_c83a09b21ea.html](https://www.studmed.ru/rachinskiy-sv-tatochenko-vk-bolezni-organov-dyhaniya-u-detey_c83a09b21ea.html) – Дата доступа: 28.05.2022.

12. Abbas, A. K. Basic immunology : functions and disorders of the immune system / A. K. Abbas, A. H. Lichtman, S. Pillai. – 5th ed. – St. Louis : Elsevier, [2016]. – 335 p. : col. ill., tab. – Mode of access: <https://www.pdfdrive.com/basic-immunology-functions-and-disorders-of-the-immune-system-d185969491.html> – Date of access: 28.05.2022.

13. Davidson's Principles and Practice of Medicine / ed. by Brian R. Walker, Nicki R. Colledge, Stuart H. Ralston, Ian D. Penman. – 22nd Edition. – Edinburgh [and oth.] : Elsevier, 2014. – 1372 p. : il. + Student consult online. – Mode of access: <https://www.pdfdrive.com/download.pdf?id=187180918&h=48127b36055c802e24ccae5f777f85c9&u=cache&ext=pdf> – Date of access: 28.05.2022.

14. Jones, T. Renal and urinary systems / T. Jones. – 4th ed. – Edinburgh [et al.] : Elsevier, Mosby, 2015. – viii, 144 p. : ill., phot., tab. + Student consult online. – (Crash course / ed. D. Horton-Szar). – Mode of access: <https://by1lib.org/dl/2461115/ca91dd> – Date of access: 28.05.2022.

15. Introduction to pediatrics / Н. С. Парамонова, В. С. Жемойтяк, П. Р. Горбачевский. – Гродно : ГрГМУ, 2012. – 360 с.

16. Nelson textbook of pediatrics. — 21th ed. / [edited by] Robert M. Kliegman [et al.] : Elsevier, 2020. – 4264 p. – Mode of access: <http://31.42.184.140/main/2394000/e4be57a004c31aeb7dc9c1943f0aeba6/%28E%C4%9Fitim%20Tanr%C4%B1s%C4%B1%29%20Robert%20M.%20Kliegman%20Joseph%20St%20Geme%20-%20Nelson%20Textbook%20of%20Pediatrics%2C%202-Volume%20Set-Elsevier%20%282019%29.pdf> – Date of access: 28.05.2022.

17. Avery's neonatology. Pathophysiology and management of the newborn. – 6th ed. / [edited by] MacDonald, Mhairi G.; Seshia, Mary M. K.; Mullett, Martha D. [et al.]. : LWW: Seventh edition, 2015. – 1216 p. – Mode of access: <https://edubookpdf.com/medical/nelson-textbook-of-pediatrics-21th-edition.html> – Date of access: 28.05.2022.

18. Buonocore, G. Neonatology: A Practical Approach to Neonatal Disease / G. Buonocore, R. Bracci, M. Weindling. – 2018. – 2528p – Mode of

access: <https://link.springer.com/referencework/10.1007/978-3-319-29489-6#about> – Date of access: 28.05.2022.

## ELECTRONIC DATABASES

1. Консультант студента. Электронная библиотека медицинского вуза. Расширенный пакет = Student consultant. Electronic library of medical high school. Extended package [Электронный ресурс] / Издательская группа «ГЭОТАР-Медиа», ООО «ИПУЗ». – Режим доступа: <http://www.studmedlib.ru> – Дата доступа: 28.05.2022. (Включает: «Электронную библиотеку медицинского ВУЗа»; ГЭОТАР-Медиа. Премиум комплект; Книги из комплекта «Консультант врача»).

2. Scopus [Electronic resource] / Elsevier. – Mode of access: <https://scopus.com> – Date of access: 28.05.2022.

3. Springer Medicine and Biomedical and Life science eBooks collections [Electronic resource] / Springer International Publishing AG. – Mode of access: <https://link.springer.com> – Date of access: 28.05.2022.

4. Springer Medicine Journals collection [Electronic resource] / Springer International Publishing AG. – Mode of access: <https://link.springer.com> – Date of access: 28.05.2022.