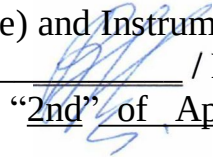


Документ подписан простой электронной подписью
Информация о владельце:
ФИО: Стегний Кирилл Владимирович
Должность: И.о. ректора
Дата подписания: 21.10.2026 17:24:02
Уникальный программный ключ:
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Federal State Budget Educational Institution
of Higher Education
Pacific State Medical University
of the Ministry of Health of the Russian Federation

APPROVED BY

Director of the Institute of Therapy (Internal
Medicine) and Instrumental Diagnostics

 / Nevzorova V.A./
“2nd” of April 2026

COLLECTION OF ASSESSMENT TOOLS

B1.V.EC.03.01 Hematology in primary care physician (district doctor) practice of the basic educational program of Higher Education

Specialty

**31.05.01 General Medicine (English-
language program)**
(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 Therapy (Internal Medicine) and
Instrumental Diagnostics

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 31.05.01 General Medicine (English-language program), 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 \(English-language program\)](#)), 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
		Mini-Case Studies
2	Interim assessment	Tests
		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 assessment

	Code	Competence description / name of labor function / name of work activity / text
S	31.05.01	General Medicine (English-language program)
C	PC-5	Ability and readiness to select patient management tactic with decision on risk factors correction program, plan of pharmacological and non-pharmacological treatment and assessment of their efficiency and safety in patients with diseases of internal organs, taking into account the diagnosis, age of the patient, and clinical picture of the disease in settings including day hospital
C	PC-6	Ability and readiness to select a type of patient routing based on current medical care procedures
F	A/03.7	Prescribing treatment and monitoring its efficiency and safety
I		ANSWER LEVEL 1 TEST QUESTIONS (ONE CORRECT ANSWER)
		1. VITAMIN B12-DEFICIENCY ANEMIA IS CHARACTERIZED BY +A) hyperchromia, macrocytosis, cytopenia B) hypochromia, microcytosis C) normochromia, normocytosis D) the presence of blast cells 2. POLYCYTHEMIA VERA OCCURS PREDOMINANTLY AT AGE +A) 60 years and older B) 20-30 years old C) 5-10 years D) 11-15 years 3. IN PATIENTS WITH IRON DEFICIENCY ANEMIA, ERYTHROCYTES IN THE COMPLETE BLOOD COUNT ARE CHARACTERIZED BY

- +A) hypochromia
- B) hyperchromia
- C) microspherocytosis
- D) acanthocytosis

4. HEMATOMA TYPE OF BLEEDING IS CHARACTERISTIC OF

- +A) hemophilia
- B) deficiency of prothrombin complex factors
- C) thrombocytopathy
- D) idiopathic (immune) thrombocytopenic purpura

5. THE PATIENT IS A 60-YEAR-OLD WOMAN WITH MILD ARTERIAL HYPERTENSION. THERE IS PRONOUNCED PROTEINURIA (UP TO 18-20 G/DAY), INCREASED PLASMA PROTEIN CONCENTRATION (95 G/L). PROBABLE DIAGNOSIS IN THIS CASE IS

- +A) multiple myeloma
- B) amyloidosis
- C) chronic glomerulonephritis
- D) chronic pyelonephritis

6. TO RESTORE BODY IRON STORES IN PATIENTS WITH IRON DEFICIENCY ANEMIA, IRON THERAPY SHOULD CONTINUE FOR

- +A) 3-6 months
- B) 2 months
- C) 3 weeks
- D) 5-7 days

7. IN THE INTESTINE, IRON IS ABSORBED THE BEST FROM

- +A) meat products
- B) fruit
- C) apples
- D) carrots

8. TREATMENT OF IRON DEFICIENCY ANEMIA IN ELDERLY PATIENTS SHOULD BE CONTINUED FOR

- +A) 3-4 months
- B) 1 month
- C) 2-3 months
- D) 2 weeks

9. THE MEDICATION PRESCRIBED FOR THE TREATMENT OF B12-DEFICIENCY ANEMIA IS

- +A) cyanocobalamin
- B) prednisolone
- C) heparin
- D) methyl dopa

10. ANEMIA, THROMBOCYTOPENIA, BLASTOSIS IN PERIPHERAL BLOOD ARE CHARACTERISTIC OF

- +A) acute leukosis
- B) erythremia
- C) aplastic anemia
- D) B12-deficiency anemia

11. DAILY PROTEINURIA MORE THAN 3.5 G, THE PRESENCE OF BENCE JONES PROTEIN, AND HYPERPROTEINEMIA ARE CHARACTERISTIC OF

- +A) multiple myeloma
- B) nephrotic syndrome
- C) Waldenström macroglobulinemia
- D) benign monoclonal gammopathy

12. ENLARGED LYMPH NODES, ENLARGED SPLEEN, AND LEUKOCYTOSIS WITH LYMPHOCYTOSIS ARE CHARACTERISTIC OF

- +A) chronic lymphocytic leukemia
- B) chronic myeloid leukemia
- C) lymphogranulomatosis
- D) acute lymphoblastic leukemia

13. TELANGIECTASES, NOSEBLEEDS, AND THE ABSENCE OF SIGNIFICANT DEVIATIONS IN THE RESULTS OF HEMOSTASIS SYSTEM EXAMINATION ARE CHARACTERISTIC OF

- +A) Rendu-Osler-Weber disease
- B) Werlhof disease
- C) Henoch-Schönlein Purpura
- D) hemophilia

14. INTRAVASCULAR HEMOLYSIS IS CHARACTERIZED BY

- +A) hemoglobinuria
- B) an increase in the level of indirect bilirubin
- C) an increase in the level of direct bilirubin
- D) urobilinuria

15. CRITERION OF COMPLETE CLINICAL AND HEMATOLOGICAL REMISSION IN ACUTE LEUKEMIA IS THE NUMBER OF BLASTS IN STERNAL PUNCTATE BELOW

- +A) 5%
- B) 1%
- C) 7%
- D) 10%

16. CHRONIC MYELOGENOUS LEUKEMIA

- +A) is one of the myeloproliferative diseases
- B) is characterized by pancytopenia
- C) occurs in patients with acute lymphoblastic leukemia
- D) occurs in patients with acute myeloid leukemia

17. TO DIAGNOSE HEMOPHILIA, IT IS NECESSARY TO DETERMINE

- +A) coagulation time
- B) bleeding time
- C) plasminogen levels
- D) fibrinogen

18. LEUKEMOID REACTIONS OCCUR PATIENTS WITH

- +A) sepsis
- B) immune hemolysis
- C) anemic syndrome
- D) leukoses

19. IRON DEFICIENCY ANEMIA IS CHARACTERIZED BY

- +A) hypochromia, microcytosis, increased iron-binding capacity of serum
- B) hypochromia, microcytosis, decreased iron-binding capacity of serum
- C) hypochromia, microcytosis, sideroblasts in sternal punctate
- D) microcytosis, target cells (codocytes)

20. INTRINSIC CASTLE FACTOR FORMS IN

- +A) fundus of the stomach
- B) duodenum
- C) small intestine
- D) colon

21. APPEARANCE OF BENCE JONES PROTEIN IN URINE IS CHARACTERISTIC OF
+A) myeloma nephropathy
B) lupus nephritis
C) dysmetabolic nephropathy
D) drug-induced nephropathy
22. TREATMENT OF DISSEMINATED INTRAVASCULAR COAGULATION SYNDROME INCLUDES USAGE OF
+A) fresh frozen plasma
B) dry plasma
C) concentrated red blood cells transfusion
D) platelet concentrate transfusion
23. THE MOST LIKELY DIAGNOSIS IN A 35-YEAR-OLD FEMALE PATIENT WHO HAS BEEN TAKING ORAL CONTRACEPTIVES FOR MORE THAN A YEAR AND PRESENTS WITH HYPOTHYROIDISM, SUBFEBRILE TEMPERATURE, COUGHING UP SPUTUM WITH BLOOD STREAKS, AND PAIN IN THE LEFT HALF OF THE CHEST IS
+A) pulmonary embolism
B) spontaneous pneumothorax
C) acute coronary syndrome
D) bronchiectasis
24. COMPLAINTS OF WEAKNESS AND PAIN IN THE SPINE, HEMOGLOBIN 65 G/L, PROTEINURIA 22G PER DAY, SERUM ALBUMIN 43G/L, AND BLOOD CREATININE 280 MMOL/L ARE CHARACTERISTIC OF
+A) multiple myeloma
B) CGN in the stage of uremia
C) secondary amyloidosis with kidney damage
D) chronic pyelonephritis
25. BENCE-JONES PROTEINURIA IS CHARACTERISTIC OF
+A) multiple myeloma
B) chronic glomerulonephritis, nephrotic form
C) rapidly progressing glomerulonephritis
D) hypernephroma
26. COMMON CLINICAL SYMPTOMS OF ANEMIA (REGARDLESS OF GENESIS) INCLUDE
+A) shortness of breath, pallor
B) bleeding, bone pain
C) enlargement of the spleen and lymph nodes
D) neurological disorders
27. INCREASED RETICULOCYTE LEVELS IN THE BLOOD ARE CHARACTERISTIC OF
+A) hemolytic anemia
B) chronic blood loss
C) aplastic anemia
D) anemia of chronic diseases
28. SIGNS OF IRON DEFICIENCY INCLUDE
+A) brittle nails and hair loss
B) jaundice of the skin and sclera
C) liver enlargement
D) paresthesia
29. VITAMIN B12 DEFICIENCY, AS OPPOSED TO FOLIC ACID DEFICIENCY, MANIFESTS WITH

- +A) funicular myelosis
- B) macrocytic anemia
- C) hyperchromic anemia
- D) megaloblastic hematopoiesis

30. COMBINATION OF ANEMIA AND ARTERIAL HYPERTENSION IS OBSERVED IN PATIENTS WITH

- +A) chronic renal failure
- B) Cushing's syndrome
- C) acromegaly
- D) B12-deficiency anemia

31. NEPHROGENIC ANEMIA

- +A) is proportional to the severity of chronic renal failure and is caused by a decrease in erythropoietin synthesis by the kidneys
- B) is caused by a chronic deficiency of vitamin B12 and folic acid
- C) is most often associated with chronic blood loss
- D) can be managed with the usage of iron supplements alone

32. MANDATORY CONTROL OF BLOOD CELL COUNTS IS NECESSARY DURING THE TREATMENT WITH

- +A) cytostatics
- B) antibiotics
- C) glucocorticosteroids
- D) thiazide diuretics

33. THE MAIN SOURCES OF HEME IRON IN THE DIET INCLUDE

- +A) meat
- B) milk and dairy products
- C) buckwheat
- D) apples

34. NUTRITIONAL CAUSES OF IRON DEFICIENCY ANEMIA INCLUDE

- +A) insufficient consumption of meat products
- B) high physical activity
- C) insufficient consumption of fresh vegetables and fruits
- D) insufficient consumption of fruits and vegetables containing iron

35. IN THE BEGINNING OF TREATMENT OF IRON DEFICIENCY ANEMIA, IRON PREPARATIONS SHOULD BE ADMINISTERED

- +A) orally
- B) intravenously
- C) intramuscularly
- D) subcutaneously

36. COMPLAINTS OF WEAKNESS, FAINTING, PERVERSION OF TASTE AND SMELL ARE MOST LIKELY INDICATING

- +A) iron deficiency anemia
- B) hypoplastic anemia
- C) hemolytic anemia
- D) B12-deficiency anemia

37. THE MOST ACCURATE TEST TO DIAGNOSE IRON DEFICIENCY ANEMIA IS

- +A) determination of ferritin level
- B) calculation of the color index
- C) erythrocyte count
- D) determination of hemoglobin level

38. DIFFERENTIAL DIAGNOSTIC SIGN OF JAUNDICE IN HEMOLYTIC ANEMIA FROM JAUNDICE IN ACTIVE CIRRHOSIS OF THE LIVER IS THE PRESENCE OF

- +A) reticulocytosis
- B) hyperbilirubinemia
- C) splenomegaly
- D) subfebrile body temperature

39. ANEMIA CHARACTERIZED BY HYPOCHROMIA, DECREASED SERUM IRON, INCREASED SERUM IRON BINDING CAPACITY, IS

- +A) iron deficiency anemia
- B) hemolytic anemia
- C) aplastic anemia
- D) B12-deficiency anemia

40. PREDNISOLONE FOR IMMUNE HEMOLYTIC ANEMIA IS PRESCRIBED AT A DOSE OF _____ MG/KG PER OS A DAY

- +A) 1-2
- B) 3-4
- C) 0.5-1
- D) 5-6

41. TREATMENT OF IRON DEFICIENCY ANEMIA MAINLY CONSISTS OF USING

- +A) iron supplements (in tablets)
- B) meat diet
- C) blood transfusion
- D) parenteral iron preparations

42. TREATMENT OF NEUROLEUKEMIA IN ACUTE LEUKEMIAS INCLUDES USAGE OF CHEMOTHERAPY MEDICATIONS ADMINISTERED

- +A) by endolumbar introduction
- B) intravenously
- C) orally
- D) intramuscularly

43. ACUTE LEUKOSIS IS THE RESULT OF

- +A) mutations of a lymph or myelopoiesis precursor cell
- B) disorders of the endocrine system
- C) pathology of the nervous system
- D) changes in metabolism

44. RELIABLE EVIDENCE OF ACUTE LEUKEMIA IS THE ____% INCREASE IN BLASTS IN BONE MARROW

- +A) 20
- B) 10
- C) 15
- D) 5

45. TYPE OF BLEEDING CHARACTERISTIC FOR PATIENTS WITH HEMOPHILIA IS

- +A) hematoma
- B) spotted-petechial
- C) vasculitic-purpuric
- D) mixed

15. CRITERION OF COMPLETE CLINICAL AND HEMATOLOGICAL REMISSION IN PATIENTS WITH ACUTE LEUKOSIS IS THE NUMBER OF BLASTS IN STERNAL PUNCTATE BELOW ____%

- +A) 5

- B) 2
- C) 10
- D) 20

47. THE CRITERION FOR NEUROLEUKEMIA IS THE PRESENCE OF CYTOSIS IN LIQUOR DUE TO

- +A) blastosis
- B) erythrocytosis
- C) neutrophilosis
- D) monocytosis

48. NEUROLEUKEMIA IS MOST COMMONLY ASSOCIATED WITH ACUTE _____ LEUKOSIS

- +A) lymphoblastic
- B) myeloblastic
- C) promyelocytic
- D) megacaryoblastic

49. RESISTANT FORM OF ACUTE LEUKOSIS IS DIAGNOSED IN THE ABSENCE OF COMPLETE CLINICAL AND HEMATOLOGICAL REMISSION AFTER CONDUCTING _____ STANDARD COURSES OF INDUCTION THERAPY

- +A) two
- B) one
- C) three
- D) four

50. HIGH INCIDENCE OF VIRAL HEPATITIS B AND C IN PATIENTS WITH ACUTE LEUKOSIS IS ASSOCIATED WITH

- +A) massive transfusion load with blood products
- B) deep immunosuppression during chemotherapy
- C) toxic damage to hepatocytes by cytostatics
- D) genetic predisposition

51. ADVERSE PROGNOSTIC FACTORS IN ACUTE LYMPHOBLASTIC LEUKOSIS INCLUDE

- +A) baseline leukocytosis above $100 \times 10^9/L$
- B) the patient being male
- C) pronounced lymphadenopathy in the onset of the disease
- D) absence of leukocytosis

52. HIGH RISK OF SPONTANEOUS BLEEDING IS PRESENT AT PLATELET COUNT OF _____ $\times 10^9/L$

- +A) less than 20
- B) 60-70
- C) 40-50
- D) 200-120

53. AN INCREASE IN PLATELET COUNT IS CHARACTERISTIC OF

- +A) essential thrombocythemia
- B) heparin-induced thrombocytopenia
- C) thrombotic thrombocytopenic purpura
- D) aplastic anemia

54. OF ALL IRON IN THE BODY _____ % IS INCLUDED IN HEMOGLOBIN

- +A) 70-73
- B) 20-30
- C) 30-40
- D) 10-20

55. NORMAL PLATELET COUNT IS _____ 109/L

- +A) 150 - 400
- B) 150 - 200
- C) 150 - 250
- D) 100 - 150

56. THROMBOCYTOPENIA CHARACTERIZED BY _____ BLEEDING TYPE

- +A) spotted-petechial
- B) hematoma
- C) vasculitic-purpuric
- D) angiomatous

57. SO-CALLED "SMUDGE CELLS" ARE

- +A) destroyed lymphocyte nuclei
- B) partially destroyed monocyte nuclei
- C) malignant cells
- D) poorly stained cells

58. INCREASE IN THE NUMBER OF ERYTHROCYTES IN PATIENTS WITH POLYCYTHEMIA VERA OCCURS DUE TO

- +A) its oncologic (tumor) nature
- B) increased erythropoietin levels
- C) decreased erythropoietin levels
- D) systemic hypoxia

59. PLETHORIC SYNDROME IN PATIENTS WITH POLYCYTHEMIA VERA MANIFESTS AS

- +A) bright red tone of the skin and mucous membranes
- B) jaundiced skin color
- C) pallor of the skin and mucous membranes
- D) bluish mucous membranes

60. LABORATORY SIGNS OF POSTHEMORRHAGIC ANEMIA INCLUDE

- +A) decreased erythrocyte count
- B) increased free hemoglobin in urine
- C) erythrocyte hypochromia
- D) increased indirect bilirubin level

61. THE MAIN MORPHOLOGICAL FEATURES OF MULTIPLE MYELOMA IN BONE MARROW INCLUDE

- +A) more than 10% of plasma cells containing traits of atypia
- B) presence of lymphoid cells with atypical features
- C) large numbers of plasmablasts
- D) presence of myeloblasts

62. MULTIPLE MYELOMA IS PRIMARILY CHARACTERIZED BY DAMAGE TO

- +A) flat bones
- B) long tubular bones
- C) large joints
- D) interphalangeal joints

63. A RELIABLE SIGN OF MULTIPLE MYELOMA IS DETECTION OF _____ % OF PLASMA CELLS IN THE BONE MARROW

- +A) 10 or more
- B) 5 – 7
- C) 7 – 9
- D) 3 – 5

64. THE MAIN DIAGNOSTIC CRITERION FOR DIAGNOSING APLASTIC ANEMIA IS

- +A) fatty metamorphosis of the hematopoietic bone marrow in the iliac bone marrow trephine biopsy
- B) pancytopenia in peripheral blood
- C) small-celled bone marrow according to myelogram
- D) increase in indirect bilirubin causing increased total level of bilirubin

65. DURATION OF OBSERVATION PERIOD OF PATIENTS WITH ACUTE LEUKOSIS FROM THE MOMENT OF ACHIEVING REMISSION IS

- +A) 5 years
- B) 1 year
- C) 3 years
- D) 2 years

66. PLETHORIC SYNDROME IN PATIENTS WITH ERYTHREMIA IS CHARACTERIZED MAINLY BY

- +A) hyperemia of the skin, headaches
- B) an increase in the volume of circulating blood
- C) full and tense pulse
- D) leukocytosis with a shift to the left

67. SMUDGE CELLS ARE DETECTED IN PATIENTS WITH

- +A) chronic lymphocytic leukosis
- B) chronic myelogenous leukosis
- C) multiple myeloma
- D) acute myelogenous leukosis

68. A CHARACTERISTIC FEATURE OF APLASTIC ANEMIA IS

- +A) pancytopenia
- B) erythrocyte hypochromia
- C) aniso-poikilocytosis
- D) macrocytosis of erythrocytes

69. IF THE PATIENT HAS ANEMIA, THROMBOCYTOPENIA, AND BLASTOSIS IN PERIPHERAL BLOOD, THE DOCTOR SHOULD SUSPECT

- +A) acute leukosis
- B) aplastic anemia
- C) B12-deficiency anemia
- D) systemic lupus erythematosus

70. STAGE III OF DIC-SYNDROME IS CHARACTERIZED BY

- +A) thrombocytopenia
- B) thrombocytosis
- C) normocoagulation
- D) hypercoagulation

71. IRON STORES IN THE BODY CAN BE MOST ACCURATELY ASSESSED BY EVALUATING

- +A) serum ferritin level
- B) transferrin level
- C) total iron binding capacity of serum
- D) serum iron level

72. B12-DEFICIENCY ANEMIA IS CHARACTERIZED BY MODERATE

- +A) leukopenia and thrombocytopenia
- B) leukopenia and thrombocytosis
- C) leukocytosis and thrombocytopenia
- D) leukocytosis and thrombocytosis

73. LEUKOCYTE FORMULA FOR IRON DEFICIENCY ANEMIA IS CHARACTERIZED BY

- +A) normal ranges
- B) leukopenia
- C) thrombocytopenia
- D) relative lymphopenia

74. HYPERSPLENISM IS DIAGNOSED BY DETECTING SPLENOMEGALY AND

- +A) leukopenia, anemia, thrombocytopenia
- B) leukocytosis, erythrocytosis, thrombocytosis
- C) leukocytosis, anemia, thrombocytopenia
- D) leukopenia, anemia, thrombocytosis

75. EVIDENCE-BASED CRITERION FOR THE DIAGNOSIS OF IRON DEFICIENCY ANEMIA IS

- +A) decrease in serum iron level
- B) decrease in the total iron-binding capacity of serum
- C) increased serum ferritin level
- D) anisocytosis and anisochromia

76. THE MAIN CYTOCHEMICAL MARKER OF ACUTE MYELOBLASTIC LEUKEMIA IS A POSITIVE REACTION TO

- +A) myeloperoxidase
- B) β -glucuronidase
- C) ATPase
- D) acid phosphatase

77. A SUFFICIENTLY RELIABLE SIGN OF CHRONIC LYMPHOCYTIC LEUKOSIS (IN COMBINATION WITH OTHER SIGNS) IS THE PERCENTAGE OF LYMPHOCYTES IN THE MYELOGRAM OVER

- +A) 30%
- b) 20%
- C) 10%
- D) 40%

78. THE PRESENCE OF THE PHILADELPHIA CHROMOSOME IS CHARACTERISTIC OF

- +A) chronic myelogenous leukosis
- B) subleukemic myelosis
- C) acute erythromyelosis
- D) acute myelomonocytic leukosis

79. MORPHOLOGICAL SUBSTRATE OF MULTIPLE MYELOMA ARE

- +A) plasmacytes
- B) lymphocytes
- C) macrophages
- D) eosinophils

80. CHANGES IN THE BONE MARROW ASSOCIATED WITH APLASTIC ANEMIA INCLUDE

- +A) decreased bone marrow cellularity, predominance of adipose tissue
- B) the predominance of the hematopoietic bone marrow over the fat marrow
- C) focal proliferation of lymphocytes
- D) narrowing of the red bone marrow

81. INDICATIONS FOR THE CYTOSTATIC THERAPY FOR ERYTHREMIA ARE

- +A) splenomegaly, leukocytosis, thrombocytosis
- B) leukopenia, thrombocytopenia

- C) plethoric syndrome
- D) erythromelalgia

82. IN PATIENTS WITH ACUTE LEUKEMIA, CYTOSTATIC THERAPY IN THE CONSOLIDATION PHASE IS IMPLEMENTED DURING

- +A) remission
- B) relapse
- C) stage of full-scale clinical manifestations
- D) terminal

83. THE MOST LIKELY DIAGNOSIS FOR A 24-YEAR-OLD MAN WITH FEVER, CHILLS, LOW BACK PAIN, HEMOGLOBIN LEVEL OF 70 G/L AND HAPTOGLOBIN BELOW NORMAL IS

- +A) intravascular hemolysis
- B) acute intermittent porphyria
- C) acute myoglobinuria
- D) extravascular hemolysis

84. PRELIMINARY DIAGNOSIS IN A 68-YEAR-OLD MAN WITH GENERALIZED LYMPHADENOPATHY, SPLENOMEGALY AND WHITE BLOOD CELLS $84 \times 10^9/L$ (BANDS 2, SEGMENTED N. 18, L. 72, M. 8) IS

- +A) chronic lymphocytic leukosis
- B) idiopathic myelofibrosis
- C) chronic myelogenous leukosis
- D) Hodgkin lymphoma

85. CLINICAL MANIFESTATIONS OF B12-DEFICIENCY ANEMIA IN THE COMPLETE ABSENCE OF VITAMIN B12 INTAKE APPEAR AFTER

- +A) 4-5 years
- B) 5-8 months
- C) 9-12 months
- D) 1-2 years

86. "D"-DIMER IS A PRODUCT OF LYSIS OF

- +A) fibrin
- B) X factor
- C) platelets
- D) thrombin

87. ALL IRON DEFICIENCY ANEMIAS ARE

- +A) hypochromic
- B) hyperchromic
- C) normochromic
- D) macrocytic

88. TRILINEAGE CYTOPENIA IS CHARACTERISTIC OF

- +A) vitamin B12 deficiency
- B) iron deficiency anemia
- C) hemolytic anemia
- D) anemia of chronic inflammation

89. THE CLINICAL MANIFESTATIONS OF AGRANULOCYTOSIS INCLUDE

- +A) necrotic tonsillitis
- B) development of heart failure
- C) hemorrhagic syndrome
- D) severe anemia

90. A PROBABLE CAUSE OF ANEMIA IN A 55-YEAR-OLD MAN WHO UNDERWENT GASTRECTOMY 7 YEARS AGO (MACROCYTOSIS IN BLOOD SMEAR) IS A DEFICIENCY OF

- +A) cyanocobalamin
- B) iron
- C) erythropoietin
- D) pyridoxine

91. IMPAIRED HEMOGLOBIN SYNTHESIS IS CHARACTERISTIC OF

- +A) iron-deficiency anemia
- B) B12-deficiency anemia
- C) aplastic anemia
- D) hemolytic anemia

92. IRON DEFICIENCY ANEMIA IS CHARACTERIZED BY

- +A) gradual development
- B) acute onset
- C) crisis progression
- D) identification of heredity

93. THINNING AND DEFORMATION OF THE NAIL PLATES, DRYNESS AND BRITTLINESS OF HAIR, SMOOTHING OF THE PAPILLAE OF THE TONGUE, AND IMPAIRED SWALLOWING OF DRY FOOD ARE A MANIFESTATION OF

- +A) sideropenic syndrome (Plummer-Vinson syndrome)
- B) general anemic syndrome
- C) funicular myelosis
- D) hemolytic crisis

94. INDICATOR REFLECTING THE SIZE OF THE ERYTHROCYTE IN THE COMPLETE BLOOD COUNT IS

- +A) MCV
- B) MCH
- C) MCHC
- D) RDW

95. RBC HYPOCHROMIA MAY OCCUR IN PATIENTS WITH

- +A) thalassemia
- B) microspherocytosis
- C) B12 deficiency
- D) glucose-6-phosphate dehydrogenase deficiency

96. IN PREGNANT WOMEN, WITH PROLONGED USE OF ANTICONVULSANTS, WITH ALCOHOL ABUSE, THERE IS A HIGH RISK OF DEVELOPING

- +A) folic acid deficiency anemia
- B) iron deficiency anemia
- C) B12-deficiency anemia
- D) hemolytic anemia

97. IN CASE OF B12-DEFICIENCY ANEMIA, IN THE COMPLETE BLOOD COUNT THERE MAY BE A TREND TOWARDS

- +A) pancytopenia
- B) leukocytosis
- C) thrombocytosis
- D) appearance of myelocytes

98. FUNICULAR MYELOSIS IS CHARACTERISTIC OF

- +A) B12-deficiency anemia
- B) aplastic anemia
- C) iron deficiency anemia
- D) hemolytic anemia

	99. DARK URINE, JAUNDICE OF THE SKIN AND SCLERA, ABDOMINAL PAIN, AND MODERATE HEPATOSPLENOMEGALY ARE CHARACTERISTIC OF +A) hemolytic anemia B) folic acid deficiency anemia C) iron deficiency anemia D) B12-deficiency anemia 100. RETICULOCYTOSIS IS CHARACTERISTIC OF +A) hemolytic anemia B) folic acid deficiency anemia C) iron deficiency anemia D) B12-deficiency anemia
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Assessment criteria

“Very good” – 80-100% correct answers of questions of every level

“Good” - 70-79% correct answers of questions of every level

“Satisfactory” - 55-69% correct answers of questions of every level

“Unsatisfactory” - less than 55% correct answers of questions of every level

Standardized case studies and checklists for **B1.V.EC.03.01 Hematology in primary care physician (district doctor) practice** course

Case Study No.1

	Code	Competence description / name of labor function / name of work activity / text
S	31.05.01	General Medicine (English-language program)
C	PC-5	Ability and readiness to select patient management tactic with decision on risk factors correction program, plan of pharmacological and non-pharmacological treatment and assessment of their efficiency and safety in patients with diseases of internal organs, taking into account the diagnosis, age of the patient, and clinical picture of the disease in settings including day hospital
C	PC-6	Ability and readiness to select a type of patient routing based on current medical care procedures
F	A/03.7	Prescribing treatment and monitoring its efficiency and safety
I		READ THE PROVIDED CASE DESCRIPTION AND GIVE DETAILED ANSWERS TO THE QUESTIONS Patient I., a 31-year-old woman, consulted a therapist about general weakness, fatigue, dizziness when changing body position, shortness of breath when walking. Additional complaints: dry skin, brittle hair and hair loss, urinary incontinence when coughing. Medical history: adheres to a vegetarian diet, has not been eating meat for the last 10 years; menstrual cycle length is 26 days, menstrual discharge present for 7 days, always abundant, with clots. Physical examination results: pallor of the skin and visible mucous membranes. Height 165 cm, weight 55 kg. Heart sounds are rhythmic, muffled; blowing systolic murmur is heard at the apex. Heart rate 87 per minute, BP 106 and 70 mm Hg. Other organ systems: no abnormalities. Complete blood count: hemoglobin 82 g/L, erythrocytes 3.5 T/L, MCV 74 fl, MCH 21 pg/er, MCHC 27

		g/dL, serum iron 5.1 $\mu\text{mol/L}$, OLSS 92 $\mu\text{mol/L}$, transferrin iron saturation ratio 15%, serum ferritin 7.4 $\mu\text{g/L}$.
Q	1	Question: What is the main clinical and laboratory syndrome, how does it manifest itself?
Q	2	Question: Make a preliminary diagnosis.
Q	3	Question: Evaluate anemia by laboratory parameters and characterize the parameters of iron metabolism in the patient
Q	4	Question: What anemias should be considered for differential diagnosis?
Q	5	Question: Prescribe treatment in accordance with the clinical guidelines for this pathology

Case Study No.1 Checklist

	Code	Competence description / name of labor function / name of work activity / text
S	31.05.01	General Medicine (English-language program)
C	PC-5	Ability and readiness to select patient management tactic with decision on risk factors correction program, plan of pharmacological and non-pharmacological treatment and assessment of their efficiency and safety in patients with diseases of internal organs, taking into account the diagnosis, age of the patient, and clinical picture of the disease in settings including day hospital
C	PC-6	Ability and readiness to select a type of patient routing based on current medical care procedures
F	A/03.7	Prescribing treatment and monitoring its efficiency and safety
I		READ THE PROVIDED CASE DESCRIPTION AND GIVE DETAILED ANSWERS TO THE QUESTIONS Patient I., a 31-year-old woman, consulted a therapist about general weakness, fatigue, dizziness when changing body position, shortness of breath when walking. Additional complaints: dry skin, brittle hair and hair loss, urinary incontinence when coughing. Medical history: adheres to a vegetarian diet, has not been eating meat for the last 10 years; menstrual cycle length is 26 days, menstrual discharge present for 7 days, always abundant, with clots. Physical examination results: pallor of the skin and visible mucous membranes. Height 165 cm, weight 55 kg. Heart sounds are rhythmic, muffled; blowing systolic murmur is heard at the apex. Heart rate 87 per minute, BP 106 and 70 mm Hg. Other organ systems: no abnormalities. Complete blood count: hemoglobin 82 g/L, erythrocytes 3.5 T/L, MCV 74 fl, MCH 21 pg/er, MCHC 27 g/dL, serum iron 5.1 $\mu\text{mol/L}$, OLSS 92 $\mu\text{mol/L}$, transferrin iron saturation ratio 15%, serum ferritin 7.4 $\mu\text{g/L}$.
Q	1	Question: What is the main clinical and laboratory syndrome, how does it manifest itself?
A		Correct answer: The patient has manifestations of anemic syndrome – weakness, increased fatigue, dizziness when changing body position, muffled heart tones, blowing systolic murmur on the apex of the heart,

		shortness of breath. Sideropenic syndrome (tissue iron deficiency) is manifested by dry skin, brittleness of hair and hair loss, urinary incontinence when coughing.
R2	Very good	Correctly names syndromes, fully indicates their clinical manifestations, and always notes the combination of general anemic syndrome with sideropenia syndrome.
R1	Good/Satisfactory	Knows general anemic and sideropenic syndromes, does not fully list clinical manifestations; does not name all criteria using correct terminology; Correctly names anemic syndrome, does not know its clinical manifestations, does not know the clinical manifestations of sideropenia syndrome.
R0	Fail	Doesn't know main syndromes, does not know their clinical signs and does not have special terminology
Q	2	Question: Make a preliminary diagnosis.
A		Correct answer: Iron deficiency anemia of moderate severity associated with hypermenorrhea.
R2	Very good	Formulates a diagnosis correctly and completely, indicating the severity; may not include hypermenorrhea (menorrhagia) in the diagnosis
R1	Good/Satisfactory	Formulates the diagnosis correctly, but does not indicate the severity correctly; Formulates a diagnosis of "anemia", does not know the form of the disease and does not indicate the severity.
R0	Fail	Cannot formulate a diagnosis
Q	3	Question: Evaluate anemia by laboratory parameters and characterize the parameters of iron metabolism in the patient
A		Correct answer: Hypochromic (MCH 21 pg/er, MCHC 27 g/dL) microcytic (MCV 74 fl) anemia. The patient has a decrease in hemoglobin level to 82 g/L, which indicates the average severity of anemia, a decrease in red blood cells to 3.5 T/L. Iron deficiency is proved by a change in indicators characterizing iron metabolism: a decrease in serum iron to 5.1 $\mu\text{mol/L}$, ferritin (7.4 $\mu\text{g/L}$), transferrin saturation coefficient (15%), an increase in the total iron-binding capacity of serum to 92 $\mu\text{mol/L}$.
R2	Very good	Lists in full the laboratory criteria for anemia and iron deficiency identified in the patient, correctly interprets laboratory data, and knows the normal values of laboratory parameters.
R1	Good/Satisfactory	Does not fully list the laboratory criteria for anemia and iron deficiency, interprets laboratory data with 1-2 errors, knows the normal values of laboratory parameters; Can evaluate 2-3 laboratory parameters, does not know the reference values for hemoglobin and red blood cells.
R0	Fail	Cannot characterize anemia using laboratory criteria, does not know iron metabolism indicators.

Q	4	Question: What anemias should be considered for differential diagnosis?
A		Correct answer: RBC hypochromia is most common in iron deficiency anemia (IDA). Other causes may be thalassemia, anemia of chronic diseases (ACD). Thalassemia – target cells in the blood, normal or elevated iron in the blood, unconjugated hyperbilirubinemia, reticulocytosis, splenomegaly (not always), jaundice of the skin and sclera of the eyes, darkening of the urine. Anemia of a chronic disease is characterized by lack of sideropenic syndrome: a change in the skin and its appendages (dryness, hair loss), a change in the mucous membranes, taste perversion, laboratory parameters: normal serum iron binding ability, increased C-reactive protein.
R2	Very good	Can conduct differential diagnosis, it is permissible to conduct differential diagnosis with B-12 deficiency anemia, aplastic, hemolytic anemia.
R1	Good/Satisfactory	Conducts a differential diagnosis with the 2 most common anemias, correctly constructs a diagnostic search, is not accurate in characterizing the clinical and laboratory manifestations of various anemias; Names the anemias with which IDA can be differentiated, but cannot make a differential diagnosis.
R0	Fail	Does not know the nosology for differential diagnosis, cannot carry out differential diagnosis.
Q	5	Question: Prescribe treatment in accordance with the clinical guidelines for this pathology
A		Correct answer: Iron-rich diet (red meat). It must be remembered that without the use of iron supplements, it is impossible to eliminate IDA. Treatment with oral iron-containing supplements (ferrous and ferric forms): stage 1: elimination of iron deficiency and anemia, stage 2: replenishment of body iron store, stage 3: relapse-prevention therapy. Treatment of anemia: iron supplements, for example, iron polymaltose, chewable tablets of 100-150 mg per day orally during meals until hemoglobin levels normalize (1-3 months). Restoration of the iron stores: daily doses of iron 50-100 mg daily orally until the normalization of ferritin levels (on average 3-4 months). Preventive treatment: 7-10 days after menstruation in therapeutic dosages. Obligatory consultation and observation by a gynecologist.
R2	Very good	Prescribes treatment in accordance with clinical recommendations, knows the forms and dosages of drugs, prescribes iron for therapeutic and prophylactic purposes, and emphasizes the importance of diet.
R1	Good/Satisfactory	Knows the different forms of iron supplements, knows the dosages, indicates the need for oral iron supplements, does not prescribe treatment to restore iron stores, does not prescribe preventive treatment;

		Uses iron supplements for treatment, does not know the prescription regimen or dosage, makes mistakes in treatment tactics.
R0	Fail	Unable to prescribe treatment in accordance with clinical guidelines, does not know the iron therapy regimen, and does not know the dosage forms and dosages of iron preparations.

Case Study No.2

	Code	Competence description / name of labor function / name of work activity / text
S	31.05.01	General Medicine (English-language program)
C	PC-5	Ability and readiness to select patient management tactic with decision on risk factors correction program, plan of pharmacological and non-pharmacological treatment and assessment of their efficiency and safety in patients with diseases of internal organs, taking into account the diagnosis, age of the patient, and clinical picture of the disease in settings including day hospital
C	PC-6	Ability and readiness to select a type of patient routing based on current medical care procedures
F	A/03.7	Prescribing treatment and monitoring its efficiency and safety
I		READ THE PROVIDED CASE DESCRIPTION AND GIVE DETAILED ANSWERS TO THE QUESTIONS Patient N., a 65-year-old woman, presents with shortness of breath when walking and climbing to the 2nd floor, palpitations, general weakness, poor appetite, feeling of numbness in the limbs, unstable gait. These symptoms first appeared about 6 months prior; the patient has a history of atrophic gastritis. Physical examination results: pallor of the skin and mucous membranes, with a yellow tint, yellow discoloration of the sclera. Heart sounds are muffled; blowing systolic murmur is heard at the apex. Heart rate 88 per minute. BP 140 and 80 mm Hg. The tongue is bright-red with smoothed papillae; liver palpated at the edge of the costal arch. A neurological examination revealed impaired deep sensitivity in the distal parts of the limbs. Complete blood count results: hemoglobin 73 g/L, erythrocytes 2.03 T/L, platelets 45 G/L, leukocytes 4.7 G/L, leukocyte formula: stab neutrophils 6%, segmented neutrophils 68%, lymphocytes 22%, monocytes 4%, ESR 31 mm per hour, erythrocyte indices: MCV 112 fl, MCH 38 pg/er, MCHC 41 g/dL. Serum iron 25.8 µmol/L, total bilirubin 25 µmol/L. In a blood smear: macrocytosis, anisocytosis, poikilocytosis, polysegmentation of neutrophil nuclei, Howell-Jolly bodies.
Q	1	Question: What is your preliminary diagnosis?
Q	2	Question: Assess laboratory test results. How to explain the increase in bilirubin?
Q	3	Question: What tests can be used to diagnose B12 deficiency?
Q	4	Question: How to explain the patient's complaints about numbness in the limbs and a shaky/unstable gait?
Q	5	Question: Outline the treatment tactics.

Case Study No.2 Checklist

	Code	Competence description / name of labor function / name of work activity / text
S	31.05.01	General Medicine (English-language program)
C	PC-5	Ability and readiness to select patient management tactic with decision on risk factors correction program, plan of pharmacological and non-pharmacological treatment and assessment of their efficiency and safety in patients with diseases of internal organs, taking into account the diagnosis, age of the patient, and clinical picture of the disease in settings including day hospital
C	PC-6	Ability and readiness to select a type of patient routing based on current medical care procedures
F	A/03.7	Prescribing treatment and monitoring its efficiency and safety
I		READ THE PROVIDED CASE DESCRIPTION AND GIVE DETAILED ANSWERS TO THE QUESTIONS Patient N., a 65-year-old woman, presents with shortness of breath when walking and climbing to the 2nd floor, palpitations, general weakness, poor appetite, feeling of numbness in the limbs, unstable gait. These symptoms first appeared about 6 months prior; the patient has a history of atrophic gastritis. Physical examination results: pallor of the skin and mucous membranes, with a yellow tint, yellow discoloration of the sclera. Heart sounds are muffled; blowing systolic murmur is heard at the apex. Heart rate 88 per minute. BP 140 and 80 mm Hg. The tongue is bright-red with smoothed papillae; liver palpated at the edge of the costal arch. A neurological examination revealed a impaired deep sensitivity in the distal parts of the limbs. Complete blood count results: hemoglobin 73 g/L, erythrocytes 2.03 T/L, platelets 45 G/L, leukocytes 4.7 G/L, leukocyte formula: stab neutrophils 6%, segmented neutrophils 68%, lymphocytes 22%, monocytes 4%, ESR 31 mm per hour, erythrocyte indices: MCV 112 fl, MCH 38 pg/er, MCHC 41 g/dL. Serum iron 25.8 µmol/L, total bilirubin 25 µmol/L. In a blood smear: macrocytosis, anisocytosis, poikilocytosis, polysegmentation of neutrophil nuclei, Howell-Jolly bodies.
Q	1	Question: What is your preliminary diagnosis?
A		Correct answer: Vitamin B12-deficiency anemia, funicular myelosis.
R2	Very good	Formulates a diagnosis correctly and completely, and can indicate signs of damage to the nervous system instead of the term “funicular myelosis.”
R1	Good/Satisfactory	Formulates the diagnosis correctly, does not indicate damage to the nervous system; Does not formulate a diagnosis completely, indicates anemia or anemic syndrome, but cannot name the cause of the anemia.
R0	Fail	Cannot formulate a diagnosis
Q	2	Question: Assess laboratory test results. How to explain the increase in bilirubin?

A		Correct answer: The patient has hyperchromic (MCH 38 pg/er, MCHC 41 g/dL) macrocytic (MCV 112 fl) anemia (decrease in hemoglobin to 73 g/L and erythrocytes to 2.03 T/L) in combination with leuko- and thrombocytopenia (pancytopenia). A decrease in hemoglobin to 73 g/L indicates moderate severity of anemia. No iron deficiency is detected (serum iron 25.8 $\mu\text{mol/L}$). The level of total bilirubin is slightly increased to 25 $\mu\text{mol/L}$. The increase in bilirubin with vitamin B12 deficiency is explained by ineffective erythropoiesis, when a large number of erythrocyte precursor cells are destroyed in the bone marrow. Intensive destruction of erythroblasts leads to the accumulation of unbound bilirubin and LDH₁ in plasma.
R2	Very good	Lists in full the laboratory criteria for vitamin B12 deficiency anemia identified in the patient, correctly interprets laboratory data, and knows the normal values of laboratory parameters.
R1	Good/Satisfactory	Does not fully list the laboratory criteria for vitamin B12 deficiency anemia, interprets laboratory data with 1-2 errors, knows the normal values of laboratory parameters; Can evaluate 2-3 laboratory parameters, does not know the reference values of most laboratory parameters.
R0	Fail	Cannot characterize anemia using laboratory criteria, cannot interpret laboratory data.
Q	3	Question: What tests can be used to diagnose B12 deficiency?
A		Correct answer: The method confirming the deficiency of vitamin B12 is the determination of vitamin B12 in blood serum: normal values are 100-250 pg/ml, low figures strongly indicate a deficiency of B12. Elevated levels of methylmalonic acid (normal range 70-279 nmol/L) and homocysteine (normal range 5-15 $\mu\text{mol/L}$) are also detected. An additional confirmation of the correct diagnosis is the reticulocyte crisis on the 7-9th day after the first injection of cyanocobalamin.
R2	Very good	Knows the types of studies and reference values; may call sternal puncture with detection of megaloblastic type of hematopoiesis a confirmation method
R1	Good/Satisfactory	Knows methods for diagnosing vitamin B12 deficiency anemia, makes mistakes in reference values; Indicates the need for laboratory testing of vitamin B12, does not know the reference values and other methods to confirm the diagnosis.
R0	Fail	Does not know any type of additional laboratory or instrumental tests indicated for the patient.
Q	4	Question: How to explain the patient's complaints about numbness in the limbs and a shaky/unstable gait?
A		Correct answer: The patient's complaints of numbness in the limbs and a shaky/unstable gait, combined with the data of a neurological examination that revealed impaired deep sensitivity in the distal limbs, are a manifestation of "funicular myelosis" – degeneration (demyelination) of the posterior and lateral columns of the spinal

		cord associated with vitamin B12 deficiency. Cyanocobalamin is a coenzyme involved in the metabolism of fatty acids (the conversion reaction of methylmalonyl-CoA to succinyl-CoA; this reaction is necessary for the metabolism of myelin in the nervous system). Deficiency of vitamin B12 causes toxic to the nervous system propionic and methylmalonic acids to accumulate. Therefore, with cyanocobalamin deficiency, along with megaloblastic anemia, damage to the nervous system is noted.
R2	Very good	Knows the pathogenesis and clinical manifestations of damage to the nervous system in vitamin B12 deficiency anemia.
R1	Good/Satisfactory	Knows the clinical manifestations of damage to the nervous system in vitamin B12-deficiency anemia, cannot explain the cause of their occurrence; Indicates the possibility of damage to the nervous system with vitamin B12-deficiency anemia, does not know the causes, is confused by the symptoms of "funicular myelosis".
R0	Fail	Does not know the causes and clinical manifestations of damage to the nervous system in vitamin B12 deficiency anemia.
Q	5	Question: Outline the treatment tactics.
A		Correct answer: Consultation with a hematologist is indicated. Treatment tactics: the patient should be treated and observed by a hematologist. Replacement therapy with vitamin B12, in the form of intramuscular injections of cyanocobalamin, is implemented. For therapeutic purposes, vitamin B12 is administered intramuscularly at 1000 µg daily until the normalization of the blood count, and then this dose is administered once a month long-term (for life). There are other treatment "regimens". For example, 1000 µg per day until hemoglobin normalization, then 1000 µg once a week for 1-2 months, then 1000 µg once a month long-term. If there are no signs of damage to the nervous system, the dosage of cyanocobalamin is 500 µg. It is recommended to eat products of animal origin (liver, kidneys, eggs, milk) and exclude alcohol.
R2	Very good	Knows treatment tactics in accordance with clinical recommendations and is familiar with treatment regimens.
R1	Good/Satisfactory	Prescribes replacement therapy with cyanocobalamin, makes mistakes in treatment regimens and treatment tactics; Knows about the need for replacement therapy with cyanocobalamin (vitamin B12), does not know the treatment regimens and treatment tactics.
R0	Fail	Does not know the drugs used for treatment and cannot prescribe treatment in accordance with clinical guidelines

Case Study No.3

	Code	Competence description / name of labor function / name of work activity / text
S	31.05.01	General Medicine (English-language program)

C	PC-5	Ability and readiness to select patient management tactic with decision on risk factors correction program, plan of pharmacological and non-pharmacological treatment and assessment of their efficiency and safety in patients with diseases of internal organs, taking into account the diagnosis, age of the patient, and clinical picture of the disease in settings including day hospital
C	PC-6	Ability and readiness to select a type of patient routing based on current medical care procedures
F	A/03.7	Prescribing treatment and monitoring its efficiency and safety
I		READ THE PROVIDED CASE DESCRIPTION AND GIVE DETAILED ANSWERS TO THE QUESTIONS A 28-year-old man presents with fever up to 39.2°C with chills, bleeding gums, appearance of "bruises" on the skin for no apparent reason, and general weakness. These symptoms first appeared 7 days prior starting with a fever appeared; the patient took acetaminophen which provided a short-term effect. Weakness began to progressively increase, bleeding of the gums appeared. From the medical history: denies the presence of chronic illnesses. Parents are healthy. The patient has secondary vocational education, works as a technologist. He served in the army on a submarine. Physical examination results: moderately severe condition. Body temperature 37.5°C. The skin is pale, of normal moisture. Ecchymosis noted on the skin of the lower extremities, as well as petechiae on the skin of the shoulders and forearms, single petechial elements in the oral cavity. Vesicular breathing heard during auscultation; RR 19 per minute. Muffled heart tones, regular rhythm. Heart rate is 92 beats per minute. BP is 100 and 65 mm Hg. The abdomen is soft and painless on palpation. The edge of the liver is palpated 1 cm below the edge of the costal arch, liver dimensions are 16×10×9 cm. The spleen is palpable, elastic, painless; dimensions on percussion are 10×8 cm. Complete blood count: red blood cells 2.3 T/L, hemoglobin 78 g/L, platelets 30.0 G/L, leukocytes – 28.9 G/L; leukocyte formula: blasts 32%, myelocytes 0%, juvenile neutrophils 0%, band cells 5%, segmented neutrophils 38%, lymphocytes 25%, ESR 30 mm/h.
Q	1	Question: What is the preliminary diagnosis?
Q	2	Question: Justify your diagnosis.
Q	3	Question: What additional examination methods are necessary to clarify the diagnosis?
Q	4	Question: Select and justify the patient management tactic.
Q	5	Question: What complications are possible in patients with this disease?

Case Study No.3 Checklist

	Code	Competence description / name of labor function / name of work activity / text
S	31.05.01	General Medicine (English-language program)
C	PC-5	Ability and readiness to select patient management tactic with decision on risk factors correction program, plan of

		pharmacological and non-pharmacological treatment and assessment of their efficiency and safety in patients with diseases of internal organs, taking into account the diagnosis, age of the patient, and clinical picture of the disease in settings including day hospital
C	PC-6	Ability and readiness to select a type of patient routing based on current medical care procedures
F	A/03.7	Prescribing treatment and monitoring its efficiency and safety
I		READ THE PROVIDED CASE DESCRIPTION AND GIVE DETAILED ANSWERS TO THE QUESTIONS A 28-year-old man presents with fever up to 39.2°C with chills, bleeding gums, appearance of "bruises" on the skin for no apparent reason, and general weakness. These symptoms first appeared 7 days prior starting with a fever appeared; the patient took acetaminophen which provided a short-term effect. Weakness began to progressively increase, bleeding of the gums appeared. From the medical history: denies the presence of chronic illnesses. Parents are healthy. The patient has secondary vocational education, works as a technologist. He served in the army on a submarine. Physical examination results: moderately severe condition. Body temperature 37.5°C. The skin is pale, of normal moisture. Ecchymosis noted on the skin of the lower extremities, as well as petechiae on the skin of the shoulders and forearms, single petechial elements in the oral cavity. Vesicular breathing heard during auscultation; RR 19 per minute. Muffled heart tones, regular rhythm. Heart rate is 92 beats per minute. BP is 100 and 65 mm Hg. The abdomen is soft and painless on palpation. The edge of the liver is palpated 1 cm below the edge of the costal arch, liver dimensions are 16×10×9 cm. The spleen is palpable, elastic, painless; dimensions on percussion are 10×8 cm. Complete blood count: red blood cells 2.3 T/L, hemoglobin 78 g/L, platelets 30.0 G/L, leukocytes – 28.9 G/L; leukocyte formula: blasts 32%, myelocytes 0%, juvenile neutrophils 0%, band cells 5%, segmented neutrophils 38%, lymphocytes 25%, ESR 30 mm/h.
Q	1	Question: What is the preliminary diagnosis?
A		Correct answer: Acute leukosis, debut. Hepatosplenomegaly. Chronic anemia of moderate severity. Thrombocytopenia Haemorrhagic syndrome.
R2	Very good	Formulates a diagnosis correctly and completely, may not include hepatosplenomegaly or thrombocytopenia in the diagnosis.
R1	Good/Satisfactory	Formulates the diagnosis correctly, does not include syndromes in the diagnosis; Formulate a diagnosis completely, does not indicate the onset of the disease, or formulates a diagnosis of leukemia, has difficulty indicating the form of leukemia.
R0	Fail	Cannot formulate a diagnosis
Q	2	Question: Justify your diagnosis.
A		Correct answer: The diagnosis of acute leukosis is made on the basis of clinical data: hepatosplenomegaly, hemorrhagic and anemic syndromes,

		intoxication. The main diagnostic criteria for acute leukosis are laboratory data in the complete blood count results: leukocytosis (less often leukopenia), the presence of blast cells, a symptom of leukemic "gap", anemia (hemoglobin 78 g/L corresponds to moderate severity) and thrombocytopenia.
R2	Very good	Justifies the diagnosis completely, points out the importance of detecting blast cells in the peripheral blood and the leukemic "gap"
R1	Good/Satisfactory	Does not fully substantiate the diagnosis, may indicate one of the key points: peripheral blood blastosis or leukemic "gap"; Can justify 2-3 syndromes, does not know what peripheral blood blastosis or leukemic "gap" is.
R0	Fail	Cannot substantiate the diagnosis
Q	3	Question: What additional examination methods are necessary to clarify the diagnosis?
A		Correct answer: Refer the patient to a hematologist for inpatient examination. The main examination methods used to clarify the diagnosis of acute leukosis are performed by a hematologist: complete blood count (leukocytosis, blasts, leukemic "gap", anemia, thrombocytopenia); sternal puncture and bone marrow trephine biopsy (20% or more blast cells in the myelogram); cytochemical examination and immunophenotyping of blasts (determination of the variant of leukosis), cytogenetic examination of the bone marrow (determination of prognostically favorable and/or unfavorable cytogenetic defects); diagnostic lumbar puncture (to exclude neuroleukemia); ultrasound of internal organs (to clarify the degree of leukemic infiltration of the liver and spleen).
R2	Very good	Correctly selects the tactics of additional examination, indicates that further examination should be carried out in a hospital by a hematologist
R1	Good/Satisfactory	Selects 2-3 types of additional research, indicates that the examination should be carried out by a hematologist; Indicates the need for a bone marrow examination, does not know other types of examination for this pathology.
R0	Fail	Does not know any type of additional laboratory or instrumental tests indicated for the patient.
Q	4	Question: Select and justify the patient management tactic.
A		Correct answer: Hospitalization in the hematology department is indicated to verify the diagnosis and treatment. Treatment includes cytostatic therapy: polychemotherapy is used according to standard programs, depending on the variant of leukosis. The stages of treatment include: induction of remission, consolidation of remission, maintenance therapy, prevention of neuroleukemia. When indicated, allogeneic bone marrow transplantation is possible.
R2	Very good	Can correctly select and justify the tactics for managing a patient with acute leukemia.
R1	Good/Satisfactory	Descriptors of incomplete answers to the question are indicated

		Prescribes polychemotherapy using cytostatics, does not fully name the stages of therapy, indicates that the patient is being treated by a hematologist; Prescribes treatment with cytostatics, does not know the stages of treatment.
R0	Fail	Does not know the medications and stages of treatment, does not know the tactics of patient management.
Q	5	Question: What complications are possible in patients with this disease?
A		Correct answer: Complications of acute leukosis include bleeding of various localization; ulcerative-necrotic lesions of the mucous membranes of the gastrointestinal tract; infections; damage to the nervous system (specific infiltration of the central nervous system, hemorrhages). Side effects of cytostatic medications include myelotoxic agranulocytosis (with a high risk of infectious complications), dyspeptic disorders (nausea, vomiting), damage to the epithelium of the mucous membranes (mucositis, enteropathy), alopecia.
R2	Very good	Knows the complications of acute leukemia, but may not indicate the side effects of cytostatics.
R1	Good/Satisfactory	Indicates only major complications (CNS damage, bleeding, infectious complications); Names 1-2 complications of acute leukemia.
R0	Fail	Does not know the complications of acute leukemia.

4. Assessment criteria for learning outcomes

"**Pass**" is given to a student who has shown a sufficiently strong knowledge of the basic concepts of the subject; is able to complete specific practical tasks outlined in the program with no outside help, use recommended reference material, and correctly evaluate the results.

"**Fail**" is given to a student who has significant gaps in knowledge of the basic concepts of the subject, is not able reach the correct solution to a specific practical task outlined in the curriculum even with outside help.