Ministry of Health of the Russian Federation
Governmental budget-funded educational institution of higher professional education
THE FIRST MOSCOW STATE MEDICAL UNIVERSITY NAMED AFTER SECHENOV

Seen and approved by
Rector _____ P.V. Glybochko

STEERING DOCUMENT OF THE COURSE
HEMATOLOGY
(*name of the course*)
basic professional curriculum of higher education - residency program
31.00.00 Clinical medicine
code and name of the enlarged group of specialties (training areas)
31.08.54 General medical practice (family medicine)
code and name of study (specialty)

Course credit value: 3 credit units

1. Purpose and objectives of the course study.

The **purpose** of mastering the "Hematology" course is the formation and development of the following professional competences by the students following basic professional curriculum of higher education, i.e. the program of residency majoring in 31.08.54 General medical practice (family medicine):

PC-5 - readiness to determine the patients' pathological conditions, symptoms, syndromes, diseases, and nosological forms in accordance with the International Statistical Classification of Diseases and Health-Related Issues;

PC-6 - readiness to monitor and treat the patients in need of medical assistance in the framework of a general practice (family medicine)

Discipline tasks - formation of a totality of knowledge, capabilities and skills. After mastering the course, the students must:

Know:

- basic issues of normal and pathological anatomy, normal and pathological physiology of the hematopoietic system and levels of their regulation;

- clinical symptoms and pathogenesis of the main haematological diseases in adults and children, their prevention, diagnosis and treatment, as well as emergency aid methods;

- the fundamentals of pharmacotherapy, pharmacokinetics and pharmacodynamics of the main groups of drugs used to treat the hematological diseases.

Be able to:

- obtain information about the disease, apply the objective methods of the patient examination, identify the common and specific symptoms of the disease;

- interpret the data of laboratory and instrumental methods of hematological diseases;

- determine the indications for hospitalization and counseling of specialists;

- conduct a differential diagnostics, substantiate the clinical diagnosis, plan and tactics of the patient follow-up;

- prepare the medical records provided for by the healthcare legislation.

Possess the skills of:

- examining a patient with hematological disease

- all kinds of injections (subcutaneous, intramuscular and intravenous)

- determining blood group and Rh factor using an express method

- determining individual and biological compatibility of blood

- determining blood suitability for transfusion

- blood transfusion

- drip and jet transfusion of medicines and blood substitutes

2. Place of the "Hematology" course in the structure of the University OPOP VO .

2.1. The discipline is optional.

2.2. The study of the course requires the knowledge, capabilities and skills formed by the previous dcourses/practices:

Propaedeutics

Knowledge of:

- the methods of an interview and clinical examination of the hematopoietic system;

- main hematological symptoms and syndromes.

Capabilities:

- to determine the functional capacity of the urinary system;

- to identify the main hematological symptoms and syndromes;

- to draw up a plan of laboratory and instrumental examination and treatment of a patient with diseases of the hematopoietic system.

Skills:

- history collection;

- methods of clinical, laboratory examination, detection of violations on the part of hematopoietic system;

- preparation of examination and treatment program for patients with blood diseases.

Therapy, nephrology, urology

Knowledge of:

- etiology and pathogenesis, clinical picture, complications and prognosis of blood diseases;

- basic principles of diagnostics, treatment and prevention of blood diseases.

Capabilities:

to carry out early diagnostics by clinical and laboratory symptoms and syndromes in a timely manner;

to conduct a differential diagnostics, treatment, and prevention of blood diseases.

Skills:

- fundamentals of diagnostics, prevention and treatment of hematological diseases.

3. Requirements for the results of mastering the "Hematology" course.

The study of the course is aimed at developing the following

professional competencies (PC) by students

No.	Code competencies	Content of the competence (or a part thereof)	As a result of studying the course, the students must:			
			Know	Be capable of	Possess	Evaluation tools*
1.	PC-5	Readiness to determine the patients' pathological conditions, symptoms, syndromes, diseases, and nosological forms in accordance with the International Statistical Classification of Diseases and Health-Related Issues.	Normal anatomy and physiology of the blood and hematopoietic system in different age periods. Risk factors for diseases/conditions of the blood and hematopoietic system, clinical symptoms and	To obtain information about the disease, apply the objective methods of examination, identify the common and specific symptoms of the disease; To interpret the survey fundings. To conduct differential diagnostics. To	Examination of the patient: survey (complaints, medical history); examination of the hematopoietic system (peripheral lymph nodes, spleen); interpretation of the complete blood count, myelogram, Coombs test, coagulation, blood	Patient supervision Reviews Test

			pathogenesis of the main syndromes and diseases of the blood in adults and children. Diagnostics of diseases of the blood and hematopoietic system, principles of formulating a diagnosis according to ICD-10.	substantiate clinical diagnosis.	and urine tests for paraprotein. Method of reading the bone X-ray.	
2.	PC-6	Readiness to monitor and treat the patients in need of medical assistance in the framework of a general practice (family medicine)	Methods of providing the curative and preventive care; Fundamentals of pharmacotherapy, pharmacokinetics and pharmacodynamics of the main groups of drugs used for treatment and emergency care in patients with hematological diseases	Justify the plan and tactics of the patient follow-up. Determine indications for hospitalization and consultations of focused specialists. Provide first aid to patients with hemolytic crisis, acute hemorrhagic syndrome, acute thrombosis/thromboembolism of vessels.	Methods of treating the patients with frequent blood and hematopoietic diseases on the hospital and outpatient setting Teaching the patients how to take the iron preparations, anticoagulants	Patient supervision Reviews Test

**types of evaluation tools, which can be used in development of competences: colloquium, test, interview by situational tasks, written or computer testing, sample calculations, individual assignments, review, essay*

4. Sections of the "Hematology" course and competences generated during their study:

No.	Competence code	Course section name	Section content in didactic units
1.	PC 5	Diagnosis of diseases of blood and hematopoietic system	Clinical, laboratory and instrumental diagnostics, as well as differential diagnosis of blood diseases in adults and children. Establishing diagnosis according to ICD-10. Interpretation of survey findings.
2.	PC 6	Treatment of diseases of blood and hematopoietic system	Clinical pharmacology of drugs used in treatment of blood diseases. Methods of providing a curative and preventive care for patients with blood diseases. Planning of treatment and preventive measures. Compliance.

5. Distribution of the course credit value.

5.1. Distribution of the course credit value and types of training activities by semesters:

Type of study	Credit value		Credit value by semesters (AH)
	volume in	volume in	

	credit units (CU)	academic hours (AH)	1	2	3	4
Classroom work, including	2	72			36	36
Lectures (L)		6			4	2
Practical training (PT)		36			18	18
Seminars (S)		30			14	16
Intern's independent work (IW)		36			18	18
Interim certification						
test/examination (specify the type)						test
TOTAL	3	108			54	54

5.2. Sections of the course, types of study and forms of current monitoring:

No.	Semester No.	Course section name	Academic work types (in AH)					Evaluation tools
			L	PW	S	IW	total	
1.	3.4	Diagnosis of diseases of blood and hematopoietic system	4	18	14	18	54	Patient supervision Case histories Test
2.	3.4	Treatment of diseases of blood and hematopoietic system	2	18	16	18	54	Patient supervision Outpatient cards Test
		TOTAL	6	36	30	36	108	

5.3. Lecture distribution by semesters:

No.	Lecture topics	Volume in AH	Semester
1.	Main hematological symptoms and syndromes. Differential diagnostics	2	3
3.	Pharmacotherapy of hematological diseases	2	3.4
4.	Risk factors and prevention of diseases of blood and hematopoietic system	2	3.4
	TOTAL (total - 6 AH)	6	

5.4. Distribution of topics of the practical classes by semesters:

No.	Practical work topics	Volume in AH	Semester
1.	Microcytic anemias. Diagnostics and differential diagnostics. Treatment.	2	3
2.	Macrocytic anemias. Diagnostics and differential diagnostics. Treatment.	2	3
3.	Hemolytic anemias. Diagnostics and differential diagnostics. Treatment.	2	3
4.	Hemoblastoses. Tactics of a general practitioner	4	3
5.	Hemorrhagic vasculitis of Henoch-Schönlein. Diagnostics, treatment, prevention	2	3
6.	Platelet vasopathies: thrombocytopenias and thrombocytopenic purpura (thrombocytopenic purpura disease). Diagnostics, treatment, prevention	4	3
7.	Hemophilias. Tactics of a general practitioner	2	3
8.	Thrombophilias: hereditary and acquired, diagnostic criteria.	2	4

	Tactics of the general practitioner		
9.	Agranulocytoses: risk factors, diagnostics and treatment. Tactics of ageneral practitioner.	2	4
10.	Lesions of hematopoietic system related to diseases/conditions of other organs and systems.	4	4
11.	Laboratory diagnostics of anemia	4	4
12.	Treatment of iron deficiency anemias	2	4
13.	Treatment of complications of hematologic diseases. Indications for specialist's advice	2	4
14.	Emergencies in hematology: hemolytic crisis, acute hemorrhagic syndrome, acute thrombosis/thromboembolism of vessels	2	4
	TOTAL (total - 36 AH)	36	

5.5. Distribution of seminar topics by semesters:

No.	Seminar topics	Volume in AH	Semester
1.	Anemic syndrome. Analysis of patients	2	3
2.	Polycythemia. Analysis of patients	2	3
3.	Cytopenias. Analysis of patients	2	3
4.	Leukemoid reaction. Analysis of patients	2	3
5.	Thrombocytopathies	2	3
6.	Polycythemias	2	3
7.	DIC	2	3
8.	Splenomegaly/hepatosplenomegaly	2	4
9.	Lymphadenopathies	2	4
10.	Blood changes upon malignant tumors	2	4
11.	Blood changes upon chronic diseases	2	4
12.	Surgical treatment of diseases of the blood and hematopoiesis. Continuity of a patient's management with doctors in hospitals and focused specialists	2	4
13.	Blood transfusion	2	4
14.	Counseling skills: teaching patients how to receive the iron preparations, anticoagulants and preventive recommendations to the patient with diseases of blood and hematopoiesis:	4	4
	TOTAL (total - 40 AH)	30	

5.6. Distribution of the intern's independent work (IW) by types and semesters:

No.	IW* type	Volume in AH	Semester
1.	Work with the literature	14	3-4
2.	Writing a review	6	4
3.	Preparation for the patient's report at the clinical analysis and reporting on the topic under discussion	3	4
4.	Working with electronic educational resources placed on the University's educational portal	10	3-4
	Writing case histories and outpatient cards	3	3-4
	TOTAL (total - AH)	36	

** types of independent work: Working with literature and other sources of information on the studied section, including in interactive form, performance of assignments stipulated by the work program (group and (or) individual) in the form of writing of case histories, reviews, essays, preparation of reports, presentations; preparation for participation in interactive classes (role and business games, trainings, game design, computer simulation, discussion), work with electronic educational resources placed on the educational portal of the University, preparation of term papers, etc.*

6. Evaluation tools to monitor the performance and results of the course mastering.

6.1. Forms of monitoring and interim assessment, types of evaluation tools:

No.	Year	Forms of control	Course section name	Evaluation tools		
				Types	Number of questions in assignment	Number of independent options
1	2	3	4	5	6	7
1.	2	test	Diagnosis of diseases of blood and hematopoietic system	tests, case studies	50	2
2.	2		Treatment of diseases of blood and hematopoietic system	tests, case studies	50	2

6.2 Examples of evaluation tools:

Test assignments, example:

No.	Assignment
1.	*Choose one correct answer:* In primary diagnostics of iron deficiency anemia, the most reliable test reflecting the body saturation with iron is the following: A. Ferritin B. Transferrin C. Serum iron D. The total iron-binding capacity of the serum hemoglobin Correct answer: A
2.	*Choose one correct answer:* The bulk of iron is obtained by the human body from A. Products of animal origin (heme iron) B. Products of vegetable origin (non-heme iron) Correct answer: B
3.	*Choose one correct answer:* In what department of gastrointestinal tract iron absorption is most intensive? A. Stomach B. Jejunum C. Colon Correct answer: B
4.	*Choose tone correct answer:* By what value should the level of hemoglobin increase after 3 weeks of therapy with oral iron preparations? A. 0.5 g/dl (5 g/l) B. 1 g/dl (10 g/l) C. 2 g/dl (20 g/l) D. 3 g/dl (30 g/l) Correct answer: B
5.	*Choose one correct answer:* What is the main complication of intravenous iron therapy? A. Change of the tooth enamel color B. Constipation refractory to therapy with laxatives C. Fatal anaphylactic reaction

	D. Reduced bone density Correct answer: C
6.	*Choose one correct answer:* The loss of iron from the body takes place in the following ways. A. Upon bleeding B. Upon vomiting C. Upon physiological excretion of urine D. With sweat Correct answer: A

Case tasks:

1. A 48-years-old patient was hospitalized with complaints of severe weakness, shortness of breath on slight exertion, dizziness, pressing pain in the chest when walking. The above complaints appeared a year ago, and are progressing gradually. His condition was regarded as angina, and he received treatment with nitrates and β-blockers without effect. During the year, he has been noting increased hair loss, and increased demand for sour, salty foods. During a regular visit to the polyclinic, reduction of Hb to 34 g/l was recorded, and therefore, the patient was hospitalized urgently.

The history contains rare colds, pneumonia, chronic hemorrhoids with occasional exacerbations.

Upon hospitalization, the patient's condition is of moderate severity. Severe pallor of mucous membranes and skin. The peripheral lymph nodes are not enlarged. There is a lung sound above the lungs, vesicular breathing, BR 22 per 1 min. The heart sounds are muffled, systolic murmur over the cardiac area, with regular rhythm, 94 per minute, BP 110/70 mm Hg. Liver and the spleen are not enlarged. Koilonychias.

In the blood test: Hb 40 g/l, color index 0.78, reticulocytes 10% , platelets $300*10^9$/L, WBC $7.8*10^9$/L, stab 4%, segmented 72%, eosinophils 2%, lymphocytes 18%, monocytes 4%. Anisocytosis, poicylocytosis, microcytosis. Serum iron 5.8 mmol/l. Urinalysis, bilirubin, creatinine, and blood sugar are within the normal limits. ECG - sinus rhythm, diffuse myocardial changes.

- What are major clinical syndromes in the patient?
- What are they conditioned by ?
- Preliminary diagnosis.
- Make a plan of examination.
- Assign treatment.

2. A 53-years-old patient arrived with complaints of hemorrhagic rash following the type of petechiae, ecchymoses, hemorrhages in the subcutaneous fat with development of bruising, weakness, sweating, temperature increase up to 37.4^0.

The patient has been sick for a week, when in the background of the temperature increase to 38^0, there was a weakness, and a single nosebleed. After the intake of aspirin, skin rash appeared. The patient was hospitalized with the suspicion as to hemorrhagic vasculitis.

Upon examination: pale skin and mucous membranes. Multiple hemorrhagic rash on the skin of the trunk, limbs, isolated petechiae on the face, microlymphadenopathy. Vesicular breathing in the lungs, without wheezing. Heart sounds are muffled, with correct rhythm, and heart rate 100 BPM. The liver is palpated at the edge of the costal arch, and the spleen is not palpable. No edema

Blood test: Hb 80 g/l, RBC $3,0*10^{12}$/L, color index 0.9, WBC $112,8*10^9$/L, eos 0%

stabs 2%, segmented 10%, lymphocytes 12%, monocytes 10%, blasts 46% , promyelocytes 20%, platelets $60*10^9$/l, ESR 62 mm/h.

- Suggested diagnosis.

- Examination program.
- Your further tactics as a general practitioner.

6.3. Evaluation tools recommended for the inclusion into the stock of evaluation tools for the final state certification.

1.Tests.

2. Examination cards, with inclusion of one question on the main sections of the general practice (family medicine), for example:

1. Clinical anatomy and physiology of hematopoietic system.
2. Iron-deficiency anemia. Differential diagnostis in an outpatient setting.
3. Hemorrhagic vasculitis of Henoch-Schönlein. Diagnostics, treatment, prevention
4. Thrombocytopenic purpura (thrombocytopenic purpura disease). Diagnostics, treatment, prevention

7. Educational, methodical and informational support of the course (printed, electronic publications, the Internet and other network resources).

7.1. References:

No	Name according to the bibliographical requirements	Number of copies	
		In the department	In the library
1	Essential Med Notes. 31st Edition. Toronto Notes for Medical Students, Inc. Toronto, Canada. 2015	1	1
2	Herold G. und Mitarbeiter. Innere Medizin. 2013	1	1
3	Kaushansky K., LichtmanM.A., BeutlerE. etal. Williams Hematology. 8nd Edition. The McGraw-Hill Companies. 2010	1	1
4	Pottgieβer T., Ophoven S. Die 50 wichtigsten Fälle Innere Medizin. 2. Auflage.2013. Elsevier GmbH. München. Urban & Fischer	1	1
5	Bernhard Hellmich. Fallbuch Innere Medizin. 4. Auflage. Stuttgart. Georg Thieme Verlag KG. 2012	1	1
6	HahnJ.-M. Checkliste Innere Medizin. 7 Auflage. GeorgThiemeVerlag. 2012	1	1
7	Hung N., Shen C.-C., Hu Y.-W. Et al. Risk of Cancer in Patients with Iron Deficiency Anemia: A Nationwide Population-Based Study. PLoS One. 2015; 10(3): e0119647	1	1
8	Killip S., Bennet J.M.T., Chambers M.D. Iron Deficiency Anemia. Am Fam Physician 2007; 75:671-8.	1	1
9	Hershko C., Camaschella C. How I treat unexplained refractory iron deficiency anemia. Blood.2014;123(3):326-333 DOI: http://dx.doi.org/10.1182/blood-2013-10-512624	1	1
10	Ayalew Tefferi. CME Information: Polycythemia vera and essential thrombocythemia: 2015 update on diagnosis, riskstratification,and management. American Journal of Hematology, Vol. 90, No. 2, February 2015	1	1
11	Thrombocytosis. Andrew I. Schafer, M.D. The New England Journal of Medicine 350; 12 March 18, 2004 P 1211-9.	1	1
12	Davis A.S., Viera A.J.,Mead M.D., MD, Leukemia: An Overview for Primary CareAm Fam Physician. 2014	1	1

	May 1; 89 (9):731-738.		

8.Financial and logistics support of the course

No.	Address of classrooms*, facilities for practical classes, physical culture and sports	Room No.	Room area (m^2)	Name of equipped classrooms, facilities for practical classes, physical culture and sports with a list of basic equipment*
1	*3*	*4*	*5*	*6*
1.	. 11 Rossilimo St., Bldg. 4, 5th floor	classroom No. 1	40	A classroom for lectures, seminars and workshops multimedia complex *(laptop, projector, screen)*
2	. 11 Rossilimo St., Bldg. 4, 5th floor	classroom No. 2	40	A classroom for lectures, seminars and workshops multimedia complex, interactive whiteboard
3	. 11 Rossolimo St., Bldg. 4	room 556	20	A classroom equipped with simulation machinery
4	. 11 Rossolimo St., Bldg. 5			In-patient facility with general therapeutic beds
5	. 19 Barrikadnaya St., Bldg. 3	a computer classroom	25	a network of multidisciplinary polyclinics "Family Doctor"
6	. 19 Barrikadnaya St., Bldg. 3	A classroom .	25	a network of multidisciplinary polyclinics "Family Doctor"

**specially equipped rooms (auditoriums, classrooms, laboratories, etc.) for lectures, seminars, practical and clinical practical training during study of the disciplines, including:*

dissecting room, anatomical museum, corps storage;

auditoriums equipped with simulation machinery;

offices for working with patients receiving medical care.

**laboratory, tool equipment (specify which), multimedia system (laptop, projector, screen), TV, video camera slide-scope, VCR, PC, video and DVD players, monitors, sets of slides, tables/multimedia visual materials on various sections of the discipline, video clips, blackboards etc.*

9.Educational technology in an interactive form, used in the process of teaching the discipline*:

Role games, lectures, discussions, training with analysis of patients

*simulation technologies: *role and business games, training, game design, computer simulation, case studies etc.; <u>non-simulation technologies</u>: lecture (subject, visualization, etc.), discussion (with and without the "brainstorming"), training, programmed instruction etc.*

A total of 20% interactive activities from the scope of classroom work.

9.1. Examples of online educational technologies:

Discussion.

Topic. Risk factors as to diseases/conditions of blood system and their correction.

Analysis of patients in a hospital (therapeutic department) and in terms of a general practice (GP's office)

9.2. Electronic educational resources used in the course of teaching the course:

No.	Name and brief description of electronic educational and information resources (electronic publications and information databases)	Number of copies, access points
1	*2*	*3*
1.	http://emedicine.medscape.com/	2

2.	http://www.aafp.org/home.html	2
3.	http://www.thennt.com/	2
4.	http://bloodjournal.hematologylibrary.org/	2
5.	http://www.ebm-netzwerk.de/	2
6.	http://bjgp.org/	2