MINISTRY OF EDUCATION AND SCIENCE OF THE RUSSIAN FEDERATION
Federal state autonomous educational institution
of higher education
«Far Eastern Federal University»
(FEFU)

SCHOOL OF BIOMEDICINE

«AGREED»
Head of education program
«General medicine»
_____ Khotimchenko Yu.S._____
(signature) (Full name)
«09» of July 2019

«APPROVED»
Director of the Department of Clinical Medicine
_____ Geltser B.I._____
(signature) (Full name)
«09» of July 2019

WORKING PROGRAM OF ACADEMIC DISCIPLINE (WPAD)
«Transfusiology»
Education program
Specialty 31.05.01 «General medicine»
Form of study: full time

year 5, semester 9
lectures 18 hours
practical classes 54 hours
laboratory works not provided
total amount of in-classroom works 72 hours
independent self-work 72 hours
including preparation to exam 27 hours
control works ()
credit not provided
exam year 5, semester 9

The working program is drawn up in accordance with the requirements of the Federal state educational standard of higher education (level of training), approved by the order of the Ministry of education and science of the Russian Federation from 09.02.2016 № 95.

The working program of the discipline was discussed at the meeting of the Department of fundamental and clinical medicine. Protocol No. 8, 09 of July 2019

Authors: Professor V. Usov, Associate Professor Kiselev A.Yu.

ANNOTATION.

Academic discipline " Transfusiology "is designed for students enrolled in the educational program of higher education 31.05.01" General medicine", included in the variable part of the curriculum discipline of choice, implemented in the 5th year in the 9th semester. The total complexity of the discipline is 144 hours, 4 credits. Federal state educational standard of higher education in the specialty 31.05.01 "General medicine" (level of training specialty) was used in the development of the working program of this discipline.

The course program is based on the medical knowledge obtained by students:

PC-5 - willingness to collect and analyze patient complaints, his medical history, examination results, laboratory, instrumental, pathological and other studies in order to recognize the condition or establish the presence or absence of the disease;

PC-10 - willingness to provide medical care for sudden acute diseases, conditions, exacerbation of chronic diseases that are not accompanied by a threat to the patient's life and do not require emergency medical care;

PC-13 - willingness to participate in the provision of medical care in emergency situations, including participation in medical evacuation;

The purpose of the academic discipline "Transfusiology" is: to teach students the theoretical and practical basics of infusion-transfusion therapy, necessary for a doctor of any specialty.

Tasks

1. Teach the basics of drawing up a program of infusion and transfusion therapy 2. To study the rules of blood transfusion, its components and products, blood substitutes

3. To study the basics of prevention and treatment of post-transfusion complications and reactions.

4. To study the basics of infusion-transfusion therapy in the treatment of pathological conditions requiring intensive care

5. Organization of work of medical institutions of blood service, organization of blood donation.

6. To study modern technologies in Transfusiology

To solve these problems, a course of thematic lectures, clinical analyzes of patients, possessing modern diagnostic methods and methods of treatment is planned.

As a result of studying this discipline, students form the following universal, general professional and professional competencies:

	Stages of competence formation	
willingness for medical use of drugs and other substances and their combinations in solving professional problems (GPC-8);	Knows	Blood components and products, blood substitutes and other means of infusion-transfusion therapy, indications, contraindications to their use, methods of administration, criteria of effectiveness, possible complications, methods of prevention and treatment of complications of ITT
	Is able to	To apply means of infusion-transfusion therapy to correct circulatory disorders, acid-base balance and water-salt metabolism.
	Possesses	Methods of infusion-transfusion therapy for the correction of circulatory disorders, acid-base balance and water-salt metabolism.
willingness to collect and analyze patient complaints, his medical history, examination results, laboratory, instrumental, pathological and other studies in order to recognize the condition or establish the presence or absence of the disease; (PC-5)	Knows	General and special methods of examination of patients who need infusion-transfusion therapy
	Is able to	Collect information on the development of the disease; apply objective methods of examination of the patient, to identify general and specific signs of the disease; assess the severity of the patient; determine the need and sequence of the use of special research methods (laboratory, x-ray, endoscopic, functional), interpret the findings in patients who need infusion-transfusion therapy
	Possesses	Formed skills that allow to establish the diagnosis and provide qualified medical care to patients who need infusion-transfusion therapy
ability to determine tactics of management of patients with	Knows	Fundamentals of management of patients who need infusion-transfusion therapy

	Stages of competence formation	
different nosological forms (PC-8);	Is able to	Draw up a program of infusion-transfusion therapy in various pathological conditions. Determine the indications for infusion-transfusion therapy.
	Possesses	Skills of establishing the diagnosis, prescribing and carrying out the necessary infusion-transfusion therapy in various pathological conditions;
willingness to provide medical care for sudden acute diseases, conditions, exacerbation of chronic diseases that are not accompanied by a threat to the patient's life and do not require emergency medical care (PC-10)	Knows	Means of infusion therapy and their mechanism of action for the treatment of sudden acute illness conditions, exacerbations of chronic diseases that are not accompanied by a threat to the patient's life and do not require emergency medical care
	Is able to	To apply means of infusion-transfusion therapy for the treatment of sudden acute diseases, conditions, exacerbation of chronic diseases that are not accompanied by a threat to the patient's life and do not require emergency medical care.
	Possesses	Skills of applying means of infusion-transfusion therapy for the treatment of sudden acute diseases, conditions, exacerbation of chronic diseases that are not accompanied by a threat to the patient's life and do not require emergency medical care
willingness to participate in the provision of emergency medical care in conditions requiring urgent medical intervention (PC-11);	Knows	Fundamentals of emergency medical care in conditions requiring urgent medical interventions, including post-transfusion reactions and complications of infusion-transfusion therapy
	Is able to	To provide emergency medical care in conditions requiring urgent medical interventions, including post-transfusion reactions and complications of infusion-transfusion therapy
	Possesses	Skills of providing emergency medical care in conditions requiring urgent medical interventions, including post-transfusion reactions and complications of infusion-transfusion therapy

I. STRUCTURE AND CONTENT OF THEORETICAL PART OF THE COURSE (18 hrs.)

Theme 1. Transfusiology - goals, objectives, specific means and methods, areas of research in the scientific discipline and the practical field of health care. Fundamentals of the legislation of the Russian Federation on the protection of public health. History of transfusiology. The main stages of the development of transfusiology. The organization of the blood and its components donation in the

Russian Federation. The procedure for medical examination of the blood and blood components donors. Monitoring the quality of blood and its components (2 hours).

Theme 2. Immunohematology. Erythrocyte antigens. Leukocyte antigens. Platelet antigens. Isohemagglutination. Agglutinins and agglutinogens. Blood groups, methods of their determination (2 hours**).**

Theme 3. Transfusion means used in infusion-transfusion therapy - donor blood, blood components and products, blood substitutes, their relationship, general characteristics, current state of the issue, the principle of "transition from component therapy to drug therapy" (2 hours).

Theme 4. Blood transfusion. Rules of blood transfusion, blood components and products, blood substitutes. Indications for blood transfusion, blood components and products. Post-transfusion complications - classifications, pathogenesis, clinical manifestations, diagnosis, prevention measures (2 hours).

Theme 5. Acute blood loss, acute massive blood loss - definition, pathophysiology, clinical manifestations, diagnosis, principles of infusion-transfusion therapy. **Chronic blood loss,** pathogenesis, clinical manifestations, diagnosis, treatment (2 hours).

Theme 6. Physiology and pathology of the hemostasis. Coagulation, anti-coagulation and fibrinolytic blood systems. External and internal pathway activation of blood coagulation. Diagnostic methods. Disseminated intravascular coagulation syndrome. Pathogenesis, clinical manifestations, diagnosis, treatment (2 hours).

Theme 7. Hemodynamics (circulatory dynamics), physiological regulation. Microcirculation. Transcapillary exchange. Hemodynamic disorders. Etiology. **Shock.** Pathogenesis of shock. Clinical manifestations, diagnosis. Principles of shock infusion transfusion therapy (2 hours)).

Theme 8. Modern technologies in transfusiology - leukofiltration, quarantine of blood components, cytopheresis, plasma inactivation methods, polymerase chain reaction (PCR)-diagnostics, etc. Alternatives to blood transfusion and its components - autohemotransfusion, hemodilution, blood saving

technologies, blood reinfusion, efferent therapy and other. Parenteral and enteral nutrition (2 hours).

Theme 9. Extracorporeal hemocorrection. Organizational and methodological foundations of therapeutic plasmapheresis and cytapheresis. Dialysis technology for the treatment of emergency conditions. Sorption hemocorrection methods. Low-intensity laser hemotherapy in clinical practice. Theoretical and methodological basis of ultraviolet blood irradiation. Prospects for the development of transfusiology (2 hours).

II. STRUCTURE AND CONTENT OF PRACTICAL COURSE PART (54 hours)

Section 1 "General issues of transfusiology" (8 hours)

Lesson 1. Transfusiology - goals, objectives, specific means and methods, areas of research in the scientific discipline and the practical field of Public Health (4 hours)

Organizational and methodological foundations of hemotherapy (Order of the Ministry of Health of the Russian Federation No. 172 of 05/25/97, Order of the Ministry of Health of the Russian Federation No. 363 of November 25, 2002, Sectoral Classifier of Blood, Its Components and Preparations). Fundamentals of the legislation of the Russian Federation on the protection of public health. Federal Law of August 22, 2004 (No. 122-ФЗ), Article 32 “On the donation of blood and its components”. Rights, obligations of the donor and social support measures provided to him. Organization of the blood and blood components donors. The procedure for medical examination of blood donor and its components. Control over the quality of blood and its components.

Lesson 2. Harvesting and preserving blood, its components and preparations, their production (4 hours)

The basics of blood conservation - strict adherence to the rules of asepsis. Work in the operating unit. Responsibilities of the doctor and nurse. Preparation of the operating unit to work. Methods of disinfection of the surgical field and methods

for the prevention of blood infection with air microflora. Methods of disinfection of the hands of the donor. Methods of taking blood from the donor in plastic containers and glass vials. Closing the container with blood. Blood collection in outdoor conditions. Control of blood groups and the correctness of certification of blood containers. Storage and transportation of conserved blood and its components. Methods of fractionation of conserved blood using centrifugation and automatic separation. Erythrocyte mass, plasma and platelet production methods. Product documentation and quality control.

Section 2 "General issues of blood transfusion, its components and blood products, blood substitutes" (20 hours)

Lesson 3. Immunohematology (4 hours).

Erythrocyte antigens. Leukocyte antigens. Platelet antigens. Blood groups by ABO, Rh, Kell, methods for their determination. Minor antigens and blood groups, their value in blood transfusion. Subgroups of blood. Phenotypes on the Rh-factor system.Занятие

Lesson 4. Transfusion means (4 hours)

The means used in infusion-transfusion therapy - donor blood, its components and preparations, blood substitutes. Their relationship, general characteristics, current state of the issue, the principle of "transition from component therapy to blood product therapy"

Lesson 5. Blood transfusion (4 hours).

Rules of blood transfusion and its components. Indications for blood transfusion, its components. Post-transfusion complications - classification, pathogenesis, clinical manifestations, diagnosis, prevention measures. Registration documentation, informed consent.

Lesson 6. Regulations for determining ABO blood groups and Rh-factor (4 hours).

Documentation. Modern means of determining blood groups (monoclonal antibodies), characteristic features, manufacturing features, rules of use and storage. Determination of blood group according to the ABO system using the

cross-over method with the help of monoclonal antibodies and standard red blood cells. The interpretation of the results and possible errors. The method of determining blood groups on the Rh-factor system, the determining the phenotype of the Rh-factor system. Rules of phenotype accounting for blood selection for blood transfusion.

Session 7. Hemopoiesis (4 hours).

The concept of a hematopoietic stem cell. Physiology of red blood cells, leukocytes and platelets. Immunoglobulins, their role. The protein composition of the blood, the value of the protein fractions of blood. Clinical blood test. The main biochemical blood parameters, their clinical significance. Pathology of hemopoiesis: anemia and erythrocytosis.

Section 3 "Selected issues of infusion-transfusion therapy in emergency pathological conditions" (20 hours)

Lesson 8. Acute blood loss (4 hours)

Acute blood loss, acute massive blood loss - definition, pathophysiology, clinic, diagnosis, principles of infusion-transfusion therapy. Chronic blood loss, pathogenesis, clinic, diagnosis, treatment.

Lesson 9. Physiology and pathology of hemostasis and fibrinolysis (8 hours)

Coagulation, anti-coagulation and fibrinolytic blood systems. External and internal pathway activation of blood coagulation. Diagnostic methods. Disseminated intravascular coagulation syndrome. Pathogenesis, clinic, diagnosis, treatment

Lesson 10. Hemodynamics (4 hours)

Hemodynamics, physiological regulation. Microcirculation. Transcapillary exchange. Hemodynamic disorders. Etiology. Shock. Pathogenesis of shock. Clinic, diagnosis. Principles of shock infusion and transfusion therapy

Session 11. Endogenous intoxication syndrome (4 hours)

Endogenous intoxication syndrome. Pathogenesis. Clinic, diagnosis. Principles of infusion-transfusion therapy. Efferent treatments for endogenous intoxication syndrome.

Lesson 12. Final lesson (6 hours)

III. TRAINING AND METHODOLOGICAL SUPPORT OF INDEPENDENT WORK OF STUDENTS

The working program of an academic discipline (WPAD) presents the main content of lectures and lessons, evaluation tools: terms and concepts necessary for mastering the discipline.

During possessing the “Transfusiology” course, the student will have to do a large amount of independent work, which includes preparation for seminars and writing an essay.

Practical trainings help students to deeper learn the material, to acquire the skills of creative work with documents and original sources.

At the introductory classes or in the curriculum, the teacher informs about the goals and objectives of this academic discipline, about thematic plans of lectures and lessons, recommended literature.

Before starting to prepare for the lesson, the student should be acquainted with its plan and list of recommended literature.

Starting the preparation for the practical lesson, the student needs to review the lecture notes, relevant sections of textbooks and tutorials, and then to work with additional literature, to make notes from recommended sources.

In the process of studying the recommended material, it is necessary to understand the construction of the theme being studied, highlight the main points, trace their logic and thereby get into the essence of the problem being studied.

It is necessary to take notes of the material being studied, which allows us to include both visual and motor memory, allows us to accumulate an individual fund of auxiliary materials for quick repetition, which was read to mobilize accumulated

knowledge. The main forms of writing: a plan (simple and detailed), extracts, theses.

In the process of preparation, it is important to compare the sources, think over the material being studied and build an algorithm of actions, carefully consider your oral presentation.

At a practical lesson, each participant must be ready to speak on all points of the plan, to be as active as possible when considering them. The presentation must be convincing and reasoned, and a simple reading of notes is not allowed. It is important to show your own attitude to what is being said, express your personal opinion, understanding, substantiate it and draw the right conclusions from what has been said. You can refer to your records, directly to the original sources, use the knowledge of monographs and publications, facts and observations of modern life, etc.

A student who did not have time to speak at a lesson can present a prepared essay to the teacher for verification and, if necessary, answer the teacher's questions on the theme of lesson to get a credit score.

The educational and methodological support of students' independent work on the academic discipline "Transfusiology" is presented in Appendix 1 and includes:

-the characteristic of tasks for independent work of students and methodical recommendations for their implementation;

- requirements for the formalization and presentation of the results of independent work;

- criteria for evaluation of the performance of independent work.

IV. CONTROL OF ACHIEVEMENT OF COURSE GOALS

N p/p	Controlled modules / sections / themes of academic discipline	Codes and stages of the formation of competencies	Evaluation tools - name	
			current control	intermediate evaluation ,

	Section 3 "Selected issues of infusion-transfusion therapy in emergency pathological conditions"	willingness for medical use of drugs and other substances and their combinations in solving professional problems (GPC-8);	Knows	EO-1 Interview	Questions of final control 1 semester -1-10
			Is able to	PW-1 Test	PW-1 Test
			Possesses	EO-3 Report	EO2 Colloquium
	Section 2 "General issues of blood transfusion, its components and blood products, blood substitutes" » Section 3 "Selected issues of infusion-transfusion therapy in emergency pathological conditions"	willingness to collect and analyze patient complaints, his medical history, examination results, laboratory, instrumental, pathological and other studies in order to recognize the condition or establish the presence or absence of the disease; (PC-5)	Knows	EO-1 Interview	Questions of final control 1 semester -11-36
			Is able to	PW-1 Test	PW-1 Test
			Possesses	EO-3 Report	EO2 Colloquium
	Section 3 "Selected issues of infusion-transfusion therapy in emergency pathological conditions"	ability to determine tactics of management of patients with different nosological forms (PC-8);	Knows	EO-1 Interview	Questions of final control 1 semester -1-36
			Is able to	PW-1 Test	PW-1 Test
			Possesses	EO-3 Report	EO2 Colloquium
	Section 1 "General issues of transfusiology" Section 2 "General issues of blood transfusion, its components and blood products, blood substitutes" Section 3 "Selected issues of infusion-transfusion therapy in emergency pathological conditions"	willingness to provide medical care for sudden acute diseases, conditions, exacerbation of chronic diseases that are not accompanied by a threat to the patient's life and do not require emergency medical care (PC-10)	Knows	EO-1 Interview	Questions of final control 1 semester -15-30
			Is able to	PW-1 Test	PW-1 Test
			Possesses	EO-3 Report	EO2 Colloquium
	Section 1 "General issues of transfusiology" Section 2 "General issues of blood transfusion, its	willingness to participate in the provision of emergency medical care in conditions requiring urgent medical	Knows	EO-1 Interview	Questions of final control 1 semester -1-10

	components and blood products, blood substitutes” Section 3 "Selected issues of infusion-transfusion therapy in emergency pathological conditions"	intervention (PC-11);	Is able to	PW-1 Test	PW-1 Test
			Possesses	EO-3 Report	EO2 Colloquium

Control and methodological materials, as well as criteria and indicators which are necessary for the evaluation of knowledge and skills, and characterizing the stages of the formation of competencies in the process of mastering the educational program are presented in Appendix 2.

V. LIST OF EDUCATIONAL LITERATURE AND INFORMATIONAL-METHODICAL REQUIREMENTS FOR THE DISCIPLINE

Primary

1. Immune Hematology / Springer International Publishing AG, part of Springer Nature 2018 https://link.springer.com/book/10.1007/978-3-319-73269-5#about

2. Small Molecules in Hematology / Springer International Publishing AG, part of Springer Nature 2018 https://link.springer.com/book/10.1007/978-3-319-91439-8#editorsandaffiliations

3. Myelodysplastic Syndromes / Springer International Publishing AG, part of Springer Nature 2018 https://link.springer.com/book/10.1007/978-3-319-76879-3#editorsandaffiliations

Additional

1. Histiocytic Disorders / Springer International Publishing AG 2018 https://link.springer.com/book/10.1007/978-3-319-59632-7#editorsandaffiliations

2. Antibody Therapy / Springer International Publishing AG, part of Springer Nature 2018 https://link.springer.com/book/10.1007/978-3-319-68038-5#editorsandaffiliations

The list of resources of the information-telecommunication network "Internet"

1. Russian Society of Surgeons / http://xn----9sbdbejx7bdduahou3a5d.xn--p1ai/
2. School of Modern Surgery / http://www.websurg.ru/
3. The main surgical portal / http://www.operabelno.ru/
4. Doctor - Surgeon Medical Surgical Portal / http://xupypr.org/
5. WebSurg / http://www.websurg.com/?lng=ru
6. MED-EDU.ru - Medical portal / http://www.medvideo.org/surgery/

LIST OF INFORMATION TECHNOLOGIES AND SOFTWARE

The location of the computer equipment on which the software is installed, the number of jobs	**List of licensed software**
Multimedia auditorium Vladivostok Russian island, Ayaks 10, building 25.1, RM. M723 Area of 80.3 m2 (Room for independent work)	Windows Seven enterprice SP3x64 Operating System Microsoft Office Professional Plus 2010 office suite that includes software for working with various types of documents (texts, spreadsheets, databases, etc.); 7Zip 9.20 - free file archiver with a high degree of data compression; ABBYY FineReader 11 - a program for optical character recognition; Adobe Acrobat XI Pro 11.0.00 - software package for creating and viewing electronic publications in PDF; WinDjView 2.0.2 - a program for recognizing and viewing files with the same format DJV and DjVu.

7. In order to provide special conditions for the education of persons with disabilities all buildings are equipped with ramps, elevators, lifts, specialized places equipped with toilet rooms, information and navigation support signs.

VI. METHODOLOGICAL RECOMMENDATIONS ON THE COMPLETING THE DISCIPLINE

The purpose of the practical classes is to consolidate the knowledge gained by students in lectures, the modeling of practical situations, and also to test the effectiveness of students' independent work.

Practical lesson usually includes interviewing students for seminars. This allows the teacher to recognize the level of students' knowledge of lecture course materials, basic textbooks, knowledge of current problems and the current situation in the modern educational space. Further, the ability of students to apply their theoretical knowledge to solving practical problems is revealed.

It is advisable to begin the preparation for the practical lesson by repeating the material of the lectures. It should be borne in mind that the lecture course is limited in time and does not allow the lecturer to consider in detail all aspects of the issue being studied. Therefore, it is required to independently expand knowledge of both theoretical and practical nature. At the same time, the lectures provide a good guide for the student to search for additional materials, since they set a certain structure and logic for studying a particular question

When working independently, the student should first of all study the material presented in the recommended literature and / or teacher’s educational literature and monographs. It is necessary to draw students' attention to the fact that not only basic textbooks are included in the library list, but also more in-depth sources on each theme of the course. A consistent study of the subject allows the student to form a stable theoretical base.

An important part of the preparation for the practical class is the work of students with scientific and analytical articles that are published in specialized periodicals. They allow you to broaden your horizons and get an idea of current problems, possible ways to solve them and / or trends in the area under study.

The final step of preparing a student for practical training should be the acquaintance with the results of scientific research relevant to each topic.

VII. CLASSROOM, EQUIPMENT AND MATERIAL REQUIREMENTS FOR THE DISCIPLINE

Name of equipped auditoria and classes for independent work	**List of basic equipment**
School of Biomedicine Aud. M 508 - 20 jobs	Mult imedia auditory: Screen with an electric drive 236 * 147 cm Trim Screen Line; DLP Projector, 3000 ANSI Lm, WXGA 1280x800, 2000: 1 EW330U Mitsubishi; document camera CP355AF Avervision, video camera MP-HD718 Multipix; The subsystem of specialized fixing equipment CORSA-2007 Tuarex; Video switching subsystem: Audio switching and sound amplification subsystem: power amplifier, wireless LAN based on 802.11a / b / g / n access points 2x2 MIMO (2SS). **Accreditation and Simulation Center**: couch phantoms of children's arms and legs for intravenous access. NS.LF03637. NS.LF03636. Virtumed NS.LF00961U Demonstration simulator for practicing skills in / in injections VirtuVI phantom for intravenous injection NS.LF01121. Virtumed The phantom system of intravenous infusion Ambu ® I. V. Trainer Training Hand for Intravenous Injection, Deluxe Model of the chest and right arm for catheterization of peripheral and central veins Venopuncture arm model Intravenous Hand Model
Reading rooms of the FEFU Scientific Library with open access to the library fund. (Building A - Level 10)	Monoblock HP RgoOpe 400 All-in-One 19.5 (1600x900), Core i3-4150T, 4GB DDR3-1600 (1x4GB), 1TB HDD 7200 SATA, DVD +/- RW, GigEth, Wi-Fi, BT, usb kbd / mse, Win7Pro (64-bit) + Win8.1Pro (64-bit), 1-1-1 Wty Internet access speed 500 Mbit / s. Jobs for people with disabilities are equipped with braille displays and printers; equipped with: portable devices for reading flat-printed texts, scanning and reading machines with a video optimizer with the ability to adjust color spectra; magnifying electronic loops and ultrasonic markers

Practical training is conducted at clinical bases.

Clinical bases:

Medical Center of the Federal State Autonomous Educational Institution of Higher Education "Far Eastern Federal University";

Regional State Autonomous Healthcare Institution "Vladivostok Clinical Hospital No. 2";

Appendix 1

THE MINISTRY OF EDUCATION AND SCIENCE OF THE RUSSIAN FEDERATION
Federal State autonomous education institution of higher education
«Far Eastern Federal University»
(FEFU)

SCHOOL OF BIOMEDICINE

TRAINING AND METHODOLOGICAL SUPPORT

INDEPENDENT WORK OF TRAINEES

in discipline **«Transfusiology»**
Educational program
Preparation for 31.05.01. General Medicine
Form of training full-time

Vladivostok
2016

Independent work includes:

1. Library and homework with educational literature and lecture notes,
2. Preparation for practical exercises,
3. Performance of an individual task
4. Preparation of the essay
5. Preparation for testing and control interview.

The procedure for the performance of independent work by students is determined by the schedule of independent work on the academic discipline.

Schedule of independent work on the academic discipline

N p/p	Date / Deadline	Type of independent work	Estimated time to complete (hour)	Form of control
9 semester				
1	1 week	Essay Individual task	21 hours	EO-3-Report, speaking on the practical class
2	1-2 week	Presentation on the essay Presentation of the results of an individual task	24 hours	EO-3-Report, speaking on the practical class
3	2 week	Preparing to exam	27 hours	EO-1-Interview PW-1 - Test

Topics of reports and essays

There are 72 hours of independent work on the discipline, within the framework of these hours 1 essay is carried out on the proposed topics.

Essays

1. Federal Law "On the donation of blood and its components" N 125-FZ of 06/20/2012
2. Order of the Ministry of Health of the Russian Federation of November 25, 2002 No. 363 "On Approval of the Instructions on the Use of Blood Components"
3. Order of the Ministry of Health of Russia dated April 2, 2013 N 183n "On approval of the rules for the clinical use of donated blood and (or) its components"

4. Donor plasmapheresis, the value of the method, the organization of plasmapheresis (equipment, rules of work in the operating room and plasmapheresis office. The technique of plasmapheresis using polymer containers, documentation)
5. Bacteriological control during the preparation of whole donor blood and its components: risk factors for bacteriological contamination of blood transfusion media, methods for monitoring the sterility of canned blood and its components, prevention of bacterial and viral infection of blood transfusion media, documentation of bacteriological control in blood service institutions
6. Transfusion operations: aseptic and antiseptic, classification of methods, techniques of infusion-transfusion therapy, their brief characteristics and indications for use.
7. General characteristics of the hemostasis system in the norm: the structure, the functional role of the individual components of the system, methods for studying the vascular-platelet and plasma links of the general hemostasis
8. Functional properties of peripheral blood cells (Erythrocytes, platelets, leukocytes)
9. Extracorporeal hemocorrection and photochemotherapy: principles, methods, indications for their use, complications
10. Pathophysiology and principles of treatment of acute blood loss
11. Acute DIC-syndrome: etiopathogenesis, clinical presentation, diagnosis and treatment in modern conditions
12. Syndrome of endogenous intoxication: etiopathogenesis, clinical presentation, diagnosis and treatment in modern conditions
13. Chronic DIC syndrome: etiopathogenesis, clinical presentation, diagnosis and treatment in modern conditions.
14. Traumatic shock: etiopathogenesis, clinical presentation, diagnosis and treatment in modern conditions.

15. Post-transfusion complications and reactions, measures in case of post-transfusion complications and reactions.
16. Medical documentation required for transfusion of blood, its components and blood substitutes, the rules for its registration.

Guidelines for writing and design of the essay

Essay - the creative activity of the student, which reproduces in its structure the research activities to solve theoretical and applied problems in a particular branch of scientific knowledge.

The essay is a model of scientific research. It is an independent work in which a student solves a problem of a theoretical or practical nature, applying the scientific principles and methods of this branch of scientific knowledge. The result of this scientific search can have not only subjective, but also objective scientific novelty, and therefore can be presented for discussion by the scientific community in the form of a scientific report or a message at a scientific-practical conference, as well as a scientific article.

The abstract is carried out under the direction of the supervisor and involves the acquisition of skills for building business cooperation based on ethical standards of scientific activity. Purposefulness, initiative, disinterested cognitive interest, responsibility for the results of their actions, conscientiousness, competence - personality traits that characterize the subject of research activities corresponding to the ideals and norms of modern science.

The essay is an independent educational and research activity of the student. The supervisor provides advisory assistance and evaluates the process and results of activities. He provides approximate themes of essay, clarifies with the student the problem and theme of research, helps to plan and organize research activities, assigns time and a minimum number of consultations.

Traditionally there was a certain structure of the abstract, the main elements of which in order of their location are the following:

1. Title page.

2. The task.

3. Table of Contents

4. List of symbols, symbols and terms (if necessary).

5. Introduction.

6. The main part.

7. Conclusion.

8. Bibliographic list.

9. Appendixes

The title page lists: educational institution, graduating department, author, scientific advisor, research theme, place and year of the essay.

The name of the essay should be as short as possible and fully comply with its content.

The table of contents reflects the names of the structural parts of the essay and the pages on which they are located. The table of contents should be placed at the beginning of work on one page.

The presence of a detailed introduction - an obligatory requirement for the abstract. Despite the small volume of this structural part, its writing causes considerable difficulties. However, a qualitatively executed introduction is the key to understanding the entire work, which testifies to the professionalism of the author.

Thus, the introduction is a very important part of the essay. The introduction should start with a justification of the relevance of the chosen theme. From how the author of the essay can choose a theme and how correctly he understands and evaluates this theme from the point of view of modernity and social significance, it characterizes his scientific maturity and professional preparedness.

In addition, in the introduction it is necessary to isolate the methodological basis of the essay, to name the authors, whose works constituted the theoretical basis of the study. A review of the literature on the theme should show the authors thorough acquaintance with special literature, his ability to systematize sources,

critically examine them, highlight the essential, determine the most important in the current state of knowledge.

The introduction reflects the importance and relevance of the chosen topic, defines the object and subject, purpose and objectives, and the chronological framework of the study.

Introduction should be completed by setting out general conclusions about the scientific and practical significance of the theme, its degree of scrutiny and providing with sources, then hypothesis is proposed.

The main part describes the essence of the problem, reveals the theme, determines the author's position, factual material is given as an argument and for illustrations of put forward provisions. The author needs to demonstrate the ability of sequential presentation of material while its analysis. Preference is given to the main facts, rather than small details.

The essay ends with the final part, which is called "conclusion". This part of the essay synthesizes scientific information, which is accumulated in the main part. This synthesis is a consistent, coherent presentation of the results obtained and their relation to a common goal and specific tasks that were set and formulated in the introduction. It is here that contains the so-called "output" knowledge, which is new in relation to the original knowledge. The conclusion may include suggestions of a practical nature, thereby increasing the value of theoretical materials.

So, in conclusion, the student should a) present the findings of the study; b) reflect the theoretical and practical significance, the novelty of the abstract; c) indicate the possibility of applying the results of the study.

After the conclusion it is accepted to place the bibliographic list of the used literature. This list is one of the essential parts of the essay and reflects the independent creative work of the author.

The list of sources used is placed at the end of the work. It is made or in alphabetical order (by the name of the author or the name of the book), or in the order in which the references appear in the text of the written work. In all cases, the full title of the work, the names of the authors or the editor of the publication

are indicated if the writing team involved a group of authors, data on the number of volumes, the name of the city and publisher in which the work was published, year of publication, number of pages.

Criteria for evaluation of the abstract.

Evaluation criteria for the abstract: the novelty of the text; the validity of the choice of source; the degree of reveal of the essence of the issue; compliance to the design requirements.

The novelty of the text:

a) the relevance of the research theme;

b) novelty and independence in the formulation of the problem, the formulation of a new aspect of the well-known problem;

c) the ability to work with research, critical literature, to systematize and structure the material;

d) the appearance of the author's position, independence of assessments and judgments;

e) stylistic unity of the text.

The degree of disclosure of the essence of the question:

a) the plan compliance with the theme of the abstract;

b) compliance of the content to the theme and plan of the essay;

c) completeness and depth of knowledge on the theme;

d) the validity of the methods and methods of working with the material;

e) the ability to generalize, draw conclusions, compare different points of view on one issue (problem).

The validity of the choice of sources: a) evaluation of the used literature: the use of the most famous works on the research topic (including journal publications of recent years, recent statistics, summaries, references, etc.)**.**

Compliance with the design requirements:

a) the correctness of references to the used literature, references;

b) assessment of literacy and presentation culture (including spelling, punctuation, stylistic culture), knowledge of terminology;

c) compliance with the requirements for the volume of the abstract.

The reviewer should clearly state the remark and questions, preferably with references to the work (possible on specific pages of the work), to research and evidence that the author did not take into account**.**

The reviewer can also indicate whether the student has addressed the theme earlier (essays, written works, creative works, olympiad works, etc.).

The reviewer can also indicate whether the student has addressed the theme earlier (essays, written works, creative works, olympiad works, etc.).

The rating "Excellent" is set if all the requirements for writing and presenting the abstract are fulfilled: the problem is indicated and its relevance is justified, a brief analysis of various points of view on the problem under consideration is made and own position is logically presented, conclusions are formulated, the theme is fully revealed, the volume is met, the requirements are met to the external design, given the correct answers to additional questions.

Evaluation of "Good" - the basic requirements for the essay are met, but there are some shortcomings. In particular, there are inaccuracies in the presentation of the material; there is no logical sequence in the judgments; not sustained volume of the abstract; there are omissions in the design; Additional questions are incomplete answers.

Assessment "Satisfactory" - there are significant deviations from the requirements for essay. In particular, the theme is only partially revealed; factual errors in the content of the abstract or when answering additional questions; there is no output.

The rating of "Unsatisfactory" - the theme of the essay is not revealed, there is a significant lack of understanding of the problem or the student's abstract is not presented.

Appendix 2

THE MINISTRY OF EDUCATION AND SCIENCE OF THE RUSSIAN FEDERATION
Federal State autonomous education institution of higher education
«Far Eastern Federal University»
(FEFU)

SCHOOL OF BIOMEDICINE

TRAINING COMPLEX OF DISCIPLINE
«Transfusiology»
Educational program
Preparation for 31.05.01. General Medicine
Form of training full-time

Vladivostok
2016

Passport of the Fund Assessment Tools is filled in accordance with the Regulations on the Funds of Evaluation Tools of Educational Programs of Higher Education - Bachelor's Programs, Specialties, FEFU Magistrates, approved by order of the Rector on 12/05/2015 No. 12-13-850.

	Stages of competence formation	
willingness for medical use of drugs and other substances and their combinations in solving professional problems (GPC-8);	Knows	Blood components and products, blood substitutes and other means of infusion-transfusion therapy, indications, contraindications to their use, methods of administration, criteria of effectiveness, possible complications, methods of prevention and treatment of complications of ITT
	Is able to	To apply means of infusion-transfusion therapy to correct circulatory disorders, acid-base balance and water-salt metabolism.
	Possesses	Methods of infusion-transfusion therapy for the correction of circulatory disorders, acid-base balance and water-salt metabolism.
willingness to collect and analyze patient complaints, his medical history, examination results, laboratory, instrumental, pathological and other studies in order to recognize the condition or establish the presence or absence of the disease; (PC-5)	Knows	General and special methods of examination of patients who need infusion-transfusion therapy
	Is able to	Collect information on the development of the disease; apply objective methods of examination of the patient, to identify general and specific signs of the disease; assess the severity of the patient; determine the need and sequence of the use of special research methods (laboratory, x-ray, endoscopic, functional), interpret the findings in patients who need infusion-transfusion therapy
	Possesses	Formed skills that allow to establish the diagnosis and provide qualified medical care to patients who need infusion-transfusion therapy
ability to determine tactics of management of patients with different nosological forms (PC-8);	Knows	Fundamentals of management of patients who need infusion-transfusion therapy
	Is able to	Draw up a program of infusion-transfusion therapy in various pathological conditions. Determine the indications for infusion-transfusion therapy.
	Possesses	Skills of establishing the diagnosis, prescribing and carrying out the necessary infusion-transfusion therapy in various pathological conditions;
willingness to provide medical care for sudden acute diseases, conditions, exacerbation of chronic diseases that are not	Knows	Means of infusion therapy and their mechanism of action for the treatment of sudden acute illness conditions, exacerbations of chronic diseases that are not accompanied by a threat to the patient's life and do not require emergency medical care

	Stages of competence formation	
accompanied by a threat to the patient's life and do not require emergency medical care (PC-10)	Is able to	To apply means of infusion-transfusion therapy for the treatment of sudden acute diseases, conditions, exacerbation of chronic diseases that are not accompanied by a threat to the patient's life and do not require emergency medical care.
	Possesses	Skills of applying means of infusion-transfusion therapy for the treatment of sudden acute diseases, conditions, exacerbation of chronic diseases that are not accompanied by a threat to the patient's life and do not require emergency medical care
willingness to participate in the provision of emergency medical care in conditions requiring urgent medical intervention (PC-11);	Knows	Fundamentals of emergency medical care in conditions requiring urgent medical interventions, including post-transfusion reactions and complications of infusion-transfusion therapy
	Is able to	To provide emergency medical care in conditions requiring urgent medical interventions, including post-transfusion reactions and complications of infusion-transfusion therapy
	Possesses	Skills of providing emergency medical care in conditions requiring urgent medical interventions, including post-transfusion reactions and complications of infusion-transfusion therapy

CONTROL FOR ATTAINING THE COURSE GOAL

N p/p	Controlled modules / sections / themes of academic discipline	Codes and stages of the formation of competencies		Evaluation tools - name	
				current control	intermediate evaluation ,
	Section 3 "Selected issues of infusion-transfusion therapy in emergency pathological conditions"	willingness for medical use of drugs and other substances and their combinations in solving professional problems (GPC-8);	Knows	EO-1 Interview	Questions of final control 1 semester -1-10
			Is able to	PW-1 Test	PW-1 Test
			Possesses	EO-3 Report	EO2 Colloquium
	Section 2 "General issues of blood transfusion, its components and blood products, blood substitutes" » Section 3 "Selected issues of infusion-transfusion therapy in	willingness to collect and analyze patient complaints, his medical history, examination results, laboratory, instrumental, pathological and other studies in order to recognize the condition or establish the presence	Knows	EO-1 Interview	Questions of final control 1 semester -11-36
			Is able to	PW-1 Test	PW-1 Test

	emergency pathological conditions"	or absence of the disease; (PC-5)	Possesses	EO-3 Report	EO2 Colloquium
	Section 3 "Selected issues of infusion-transfusion therapy in emergency pathological conditions"	ability to determine tactics of management of patients with different nosological forms (PC-8);	Knows	EO-1 Interview	Questions of final control 1 semester -1-36
			Is able to	PW-1 Test	PW-1 Test
			Possesses	EO-3 Report	EO2 Colloquium
	Section 1 "General issues of transfusiology" Section 2 "General issues of blood transfusion, its components and blood products, blood substitutes" Section 3 "Selected issues of infusion-transfusion therapy in emergency pathological conditions"	willingness to provide medical care for sudden acute diseases, conditions, exacerbation of chronic diseases that are not accompanied by a threat to the patient's life and do not require emergency medical care (PC-10)	Knows	EO-1 Interview	Questions of final control 1 semester -15-30
			Is able to	PW-1 Test	PW-1 Test
			Possesses	EO-3 Report	EO2 Colloquium
	Section 1 "General issues of transfusiology" Section 2 "General issues of blood transfusion, its components and blood products, blood substitutes" Section 3 "Selected issues of infusion-transfusion therapy in emergency pathological conditions"	willingness to participate in the provision of emergency medical care in conditions requiring urgent medical intervention (PC-11);	Knows	EO-1 Interview	Questions of final control 1 semester -1-10
			Is able to	PW-1 Test	PW-1 Test
			Possesses	EO-3 Report	EO2 Colloquium

The scale of assessment the level of formation of competences

Code and formulation of competence	Stages of the formation of competencies		Criteria	Indicators	Credits
willingness for medical use of drugs and other substances and their combinations in solving professional problems (GPC-8);	Knows (threshold level)	Blood components and products, blood substitutes and other means of infusion-transfusion therapy, indications, contraindications to their use, methods of administration, criteria of effectiveness, possible complications, methods of prevention and treatment of complications of ITT	Knowledge of the blood components and products, blood substitutes and other means of infusion-transfusion therapy, indications, contraindications to their use, methods of administration, criteria of effectiveness, possible complications, methods of prevention and treatment of complications of ITT	Formed and structured systematic knowledge of the blood components and products, blood substitutes and other means of infusion-transfusion therapy, indications, contraindications to their use, methods of administration, criteria of effectiveness, possible complications, methods of prevention and treatment of complications of ITT	65-71
	Is able to (advanced)	To apply means of infusion-transfusion therapy to correct circulatory disorders, acid-base balance and water-salt metabolism.	Ability to apply means of infusion-transfusion therapy to correct circulatory disorders, acid-base balance and water-salt metabolism.	Ready and can apply means of infusion-transfusion therapy to correct circulatory disorders, acid-base balance and water-salt metabolism.	71-84
	Possesses (high)	Methods of infusion-transfusion therapy for the correction of circulatory disorders, acid-base balance and water-salt metabolism.	Skills to apply means of infusion-transfusion therapy to correct circulatory disorders, acid-base balance and water-salt metabolism.	Systematic use of skills to apply means of infusion-transfusion therapy to correct circulatory disorders, acid-base balance and water-salt metabolism.	85-100
willingness to collect and analyze patient complaints, his medical history, examination results, laboratory, instrumental, pathological and other studies in order to recognize the condition or establish the presence or absence of the disease;	Knows (threshold level)	General and special methods of examination of patients who need infusion-transfusion therapy	Knowledge of general and special methods of examination of patients who need infusion-transfusion therapy	Formed and structured systematic knowledge of the general and special methods of examination of patients who need infusion-transfusion therapy	65-71
	Is able to (advanced)	Collect information on the development of the disease; apply objective methods of examination of the	Ability to collect information on the development of the disease; apply objective methods	Ready and can to collect information on the development of the disease; apply objective	71-84

(PC-5)		patient, to identify general and specific signs of the disease; assess the severity of the patient; determine the need and sequence of the use of special research methods (laboratory, x-ray, endoscopic, functional), interpret the findings in patients who need infusion-transfusion therapy	of examination of the patient, to identify general and specific signs of the disease; assess the severity of the patient; determine the need and sequence of the use of special research methods (laboratory, x-ray, endoscopic, functional), interpret the findings in patients who need infusion-transfusion therapy.	methods of examination of the patient, to identify general and specific signs of the disease; assess the severity of the patient; determine the need and sequence of the use of special research methods (laboratory, x-ray, endoscopic, functional), interpret the findings in patients who need infusion-transfusion therapy	
	Possesses (high)	Skills that allow to establish the diagnosis and provide qualified medical care to patients who need infusion-transfusion therapy	Skill to establish the diagnosis and provide qualified medical care to patients who need infusion-transfusion therapy	Formed skills that allow to establish the diagnosis and provide qualified medical care to patients who need infusion-transfusion therapy	85-100
ability to determine tactics of management of patients with different nosological forms (PC-8);	Knows (threshold level)	Fundamentals of management of patients who need infusion-transfusion therapy	Knowledge of fundamentals of management of patients who need infusion-transfusion therapy	Formed and structured systematic knowledge of the fundamentals of management of patients who need infusion-transfusion therapy	65-71
	Is able to (advanced)	Draw up a program of infusion-transfusion therapy in various pathological conditions. Determine the indications for infusion-transfusion therapy.	Ability to draw up a program of infusion-transfusion therapy in various pathological conditions. Determine the indications for infusion-transfusion therapy	Ready and can to draw up a program of infusion-transfusion therapy in various pathological conditions. Determine the indications for infusion-transfusion therapy	71-84
	Possesses (high)	Skills of establishing the diagnosis, prescribing and carrying out the necessary infusion-transfusion therapy in various pathological conditions;	Formed skills of establishing the diagnosis, prescribing and carrying out the necessary infusion-transfusion therapy in various pathological conditions	Skills surely to establish the diagnose, prescribe and conduct the necessary infusion-transfusion therapy in various pathological conditions;	85-100

willingness to provide medical care for sudden acute diseases, conditions, exacerbation of chronic diseases that are not accompanied by a threat to the patient's life and do not require emergency medical care (PC-10)	Knows (threshold level)	Means of infusion therapy and their mechanism of action for the treatment of sudden acute illness conditions, exacerbations of chronic diseases that are not accompanied by a threat to the patient's life and do not require emergency medical care	Knowledge of the means of infusion therapy and their mechanism of action for the treatment of sudden acute illness conditions, exacerbations of chronic diseases that are not accompanied by a threat to the patient's life and do not require emergency medical care	Formed and structured systematic knowledge of the means of infusion therapy and their mechanism of action for the treatment of sudden acute illness conditions, exacerbations of chronic diseases that are not accompanied by a threat to the patient's life and do not require emergency medical care	65-71
	Is able to (advanced)	To apply means of infusion-transfusion therapy for the treatment of sudden acute diseases, conditions, exacerbation of chronic diseases that are not accompanied by a threat to the patient's life and do not require emergency medical care.	Ability to apply means of infusion-transfusion therapy for the treatment of sudden acute diseases, conditions, exacerbation of chronic diseases that are not accompanied by a threat to the patient's life and do not require emergency medical care.	Ready and can to apply means of infusion-transfusion therapy for the treatment of sudden acute diseases, conditions, exacerbation of chronic diseases that are not accompanied by a threat to the patient's life and do not require emergency medical care.	71-84
	Possesses (high)	Skills of applying means of infusion-transfusion therapy for the treatment of sudden acute diseases, conditions, exacerbation of chronic diseases that are not accompanied by a threat to the patient's life and do not require emergency medical care	Formed skills of applying means of infusion-transfusion therapy for the treatment of sudden acute diseases, conditions, exacerbation of chronic diseases that are not accompanied by a threat to the patient's life and do not require emergency medical care	Ability to use means of infusion-transfusion therapy for the treatment of sudden acute diseases, conditions, exacerbation of chronic diseases that are not accompanied by a threat to the patient's life and do not require emergency medical care	85-100
willingness to participate in the provision of emergency medical care in conditions requiring urgent medical intervention (PC-	Knows (threshold level)	Fundamentals of emergency medical care in conditions requiring urgent medical interventions, including post-transfusion reactions and complications of infusion-transfusion	Knowledge of fundamentals of emergency medical care in conditions requiring urgent medical interventions, including post-transfusion reactions and	Formed and structured systematic knowledge of fundamentals of emergency medical care in conditions requiring urgent medical interventions,	65-71

11);		therapy	complications of infusion-transfusion therapy	including post-transfusion reactions and complications of infusion-transfusion therapy	
	Is able to (advanced)	To provide emergency medical care in conditions requiring urgent medical interventions, including post-transfusion reactions and complications of infusion-transfusion therapy	Ability to provide emergency medical care in conditions requiring urgent medical interventions, including post-transfusion reactions and complications of infusion-transfusion therapy	Ready and can to provide emergency medical care in conditions requiring urgent medical interventions, including post-transfusion reactions and complications of infusion-transfusion therapy	71-84
	Possesses (high)	Skills of providing emergency medical care in conditions requiring urgent medical interventions, including post-transfusion reactions and complications of infusion-transfusion therapy	Formed skills of providing emergency medical care in conditions requiring urgent medical interventions, including post-transfusion reactions and complications of infusion-transfusion therapy	Skills surely to provide emergency medical care in conditions requiring urgent medical interventions, including post-transfusion reactions and complications of infusion-transfusion therapy	85-100

Questions to evaluate the preliminary competencies

1. Aseptic and antiseptic
2. Burn disease. Burn shock. The difference of burn shock from traumatic. Principles of burn shock treatment.
3. Syndrome of systemic inflammatory response. Criteria. The reaction of organs and systems in the case of the development of SSIR. Principles of treatment.
4. Congelation (cold injury). The reaction of tissues to the action of low temperatures. Pre-reactive and reactive frostbite period. Principles of treatment.
5. Hemodynamics. Main constants. Physiological regulation of hemodynamics.
6. Shock. Varieties of shock. Pathophysiology of shock.
7. Endogenous intoxication syndrome. Etiology. Pathophysiological mechanisms of endogenous intoxication.

8. Clotting, anti-clotting and fibrinolytic blood systems.

9. Acid-alkaline balance and water-electrolyte balance of the human body, the main constants.

10. Hypoxia, types of hypoxia. Pathophysiology of various types of hypoxia.

Control tests are designed for students studying the course "Transfusiology"

Tests are necessary both for the control of knowledge in the learning process, and for the evaluation of knowledge, for setting credits.

When working with tests, the student is invited to choose one option or a combination of answers from the answers given. At the same time, tests are unequal in their complexity. Among the proposed tests there are that contain several options for correct answers. The student must specify all the correct answers.

Tests are designed for both individual and collective decision. They can be used during classroom or independent work.

The results of the test tasks are evaluated by the teacher on a five-point score scale for issuing attestation or according to the system “credit” - “no credit”. The mark "excellent" is set with the correct answer to more than 90% of the tests proposed by the teacher. A rating of "good" - with the correct answer to more than 70% of tests. A rating of "satisfactory" - with the correct answer to 50% of the tests proposed to the student.

Examples of test tasks.

1. REINFUSION - IS A TRANSFUSION of

a. blood that's spilled into the hollow organs
b. blood that's spilled into the cavity
c. blood after effusion.
d. canned blood

2. BLOOD GROUP ABO AND RH FACTOR WITH THE REPEATED BLOOD TRANSFUSIONS SHOULD

a. determine only before the first transfusion
b. take from medical history
c. take from the patient's passport
d. determine before each transfusion

3. TEST FOR INDIVIDUAL ABO COMPATIBILITY, WHEN THE REPEATED HEMOTRANSFUSIONS SHOULD

a. be carried out before each transfusion
b. be carried out just before the first transfusion.
c. not be to carried out, as it is possible to take data from the anamnesis
d. not be to carried, as the data are available in the history of disease

4. THE HEMODYNAMIC BLOOD SUBSTITUTE IS

a. Albumen
b. Refortan
c. Intralipid
d. Chlosol

5. WHEN DETERMINING ABO BLOOD GROUP, THE 0.9% NaCl SOLUTION IS ADDED TO

a. accelerate the agglutination reaction
b. distinguish group IV from others
c. distinguish true agglutination from false
d. determine the suitability of blood for transfusion

6. BLOOD TRANSFUSION IS CONTRAINDICATED AT

a. severe intoxication

b. shock

c. loss of more than 25% BV

d. severe kidney impairment

7. TRANSFUSION OF PLASMA IS NEEDED TO CONDUCT A TEST ON

a. biological compatibility

b. RH compatibility

c. individual compatibility

d. tests do not need

8. COMPONENT OF BLOOD IS

a. cryoprecipitate

b. red blood cell concentrate

c. albumen

d. fibrinogen

9. EARLY SYMPTOM OF THE INCOMPATIBLE BLOOD TRANSFUSION IS

a. pupil constriction

b. abdominal and lower back pain

c. anuria

d. a feeling of tightness in the chest

10. BLOOD O (I) GROUPS CONTAINS AGGLUTININS

a. αβ

b. α

c. β

d. 0 (None)

11. BLOOD A (II) GROUPS CONTAIN AGGLUTININS

a. αβ

b. α
c. β
d. 0 (None)

12. BLOOD B (III) CONTAIN AGGLUTININS
a. αβ
b. α
c. β
d. 0 (None)

13. BLOOD AB (IV) CONTAINS AGGLUTININS
a. αβ
b. α
c. β
d. . 0 (None)

14. IF AN AGGLUTINATION OCCURS DURING THE TEST FOR COMPATIBILITY ON THE Rh-FACTOR, THEN THE BLOOD OF THE DONOR IS

a. Rh-positive
b. compatible on Rh-factor
c. Rh-negative
d. incompatible on Rh factor

15. DURING THE BIOLOGICAL TEST THE ERYTHROCYTES CONCENTRATE IS POURED AT RATE:
a. 40-60 drops per minute
b. jet introduction
c. 20-30 drops per minute

d. 10-20 drops per minute

16. COMPONENTS FOR CONDUCTING THE INDIVIDUAL COMPATIBILITY TEST, WHEN BLOOD TRANSFUSION, ARE

a. donor plasma and recipient serum
b. recipient plasma and donor serum
c. donor plasma and recipient's blood
d. recipient serum and donor blood

17. IF AGGLUTINATION DOES NOT OCCUR DURING THE TEST FOR Rh-FACTOR COMPATIBILITY, THE BLOOD OF DONOR IS

a. Rh-factor compatible
b. ABO group - compatible
c. incompatible on Rh-factor
d. incompatible on ABO- group

18. TRANSFUSION OF ERYTHROCYTE CONCENTRATE IS APPLICABLE FOR ONLY

a. increasing blood volume
b. parenteral nutrition
c. detoxification
d. replacement purpose

19. AGGLUTINATION REACTION IS

a. activation of blood coagulation
b. Rh-factor immunization
c. intravascular coagulation
d. gluing of erythrocytes with their subsequent destruction

20. AT THE FIRST SIGNS OF THE HEMOTRANSFUSION SHOCK WHEN BLOOD TRANSFUSION, IT IS NECESSARY TO

a. change the infusion system and introduce blood substitutes
b. block the infusion system, remove the needle from the vein
c. reduce the speed and continue blood transfusion
d. continue blood transfusion and urgently to introduce drugs

21. BLOOD COMPONENT, WHICH HAS A COMPLEX EFFECT ON THE COAGULATION SYSTEM
a. leukocyte concentrate
b. plasma
c. erythrocyte concentrate
d. platelet concentrate

22. BLOOD SUBSTITUTES FROM THE HYDROXYETHYL STARCH ARE USED FOR
a. parenteral nutrition
b. detoxication
c. shock treatment
d. accelerate blood clotting

23. BLOOD SUBSTITUTES FROM THE AMINO ACIDS ARE USED FOR
a. parenteral nutrition
b. detoxication
c. shock treatment
d. accelerate blood clotting

24. FRESH FROZEN PLASMA IS USED
a. parenteral nutrition
b. detoxication
c. shock treatment
d. accelerate blood clotting

Situational tasks (examples)

Performed using basic knowledge of the academic subject

Criteria for evaluation:

Credited - the student solved the situational problem without errors

Not credited - the student could not solve the situational problem

Task 1.

A patient with a traumatic amputation of the tibia (road injury) was admitted to the hospital. The patient was taken by ambulance accompanied by a doctor. The patient has a catheter that is inserted into the peripheral vein, Refortan is poured, a tourniquet is applied to the upper third of the leg. The condition of the victim is severe. The patient is conscious, complaining of pain in the injured limb, weakness. dizziness. Skin is pale, pulse is filiform, heart rate - 120 in 1 min. Blood Pressure (BP) 70/40 mm Hg. Moderate shortness of breath - up to 24 in 1 min. During auscultation, vesicular breathing is heard in all parts of the lungs.

Questions:

1. Decide on the advisability of infusion-transfusion therapy
2. Is it possible to carry out emergency surgery?
3. What laboratory tests should be performed first?
4. What are the methods to determine the ABO blood group?
5. To issue a direction to a laboratory to determine ABO and Rh-factor blood groups.
6. What causes can lead to the presence of antibodies to the Rh-factor in the patient?
7. How to determine if the blood is suitable for transfusion?
8. What tests are carried out before blood transfusion?
9. What are the contraindications for blood transfusion in this situation?
10. What are indications for blood transfusion in this situation?

Task 2.

The patient was admitted to the hospital 5 hours after the injury. On admission, he was diagnosed with a thermal burn of 3 degrees of 30% of TBSA. The patient's body weight is 86 kg. The condition is severe, moderate pain. Intact skin is pale, cold to the touch. Respiratory rate is up to 24 per minute. There is no airway burn. BP - 110/70 mm Hg. HR - 90 in 1min, CVP - 0 mm water column. In the blood analysis – RBC- 5.89 * 10^{12}/l, Hb-165g /l., Ht 60.

Questions:

1. Write the diagnosis of complications of thermal burn on admission?
2. Calculate the Frank index.
3. What blood substitutes can be used for volemic correction?
4. Is it advisable to use crystalloid solutions in the treatment of this patient?
5. Calculate the volume of infusion therapy in the first day.
6. Calculate the volume of infusion therapy on the second day
7. Criteria for the effectiveness of infusion therapy in this patient's condition
8. What are the blood substitutes for hemodynamic action (all groups)?
9. Write the value of CVP to control the effectiveness of infusion therapy.

Task 3.

A patient was admitted to the hospital after a road accident. He was taken by ambulance. Diagnosis at admission: fracture of the left hip, multiple rib fractures on the right. The victim complains of pain in the left thigh and chest, aggravated by inspiration and cough.

The patient's condition is severe, conscious, but inhibited, the skin is pale, cold. On the right side of the chest there are multiple abrasions and hematoma, crepitus is determined, with auscultation the breathing is sharply weakened. On the left there is vesicular breathing, it is distributed in all areas. Respiratory rate - 26 per min. Pulse is thready, BP - 60/40 mm Hg, heart rate - 120 per 1 min.

Beller’s splint is applied to the left lower limb. At the level of the middle third of the left thigh, edema and deformity are determined.

Questions:

1. Your preliminary diagnosis?
2. Urgent measures and their sequence?
3. What research is needed in the first place?
4. Are there indications for blood transfusion?
5. Is emergency hip fracture surgery indicated?
6. What is the difference between shock and collapse?

Task 4.

The patient was taken to hospital by emergency medical assistance. The patient complains of severe weakness, dizziness. From the anamnesis it was found out that the patient had repeated vomiting for the last 6 hours: first brown color, and then unchanged blood. The patient was found to be unconscious by relatives. In the ambulance during transportation the intravenous infusion therapy with crystalloid solutions was carried out. The patient's condition is severe. The patient is conscious, but slowed down, answers questions. The skin is pale, cold. Respiratory rate - 26 per 1 min. Pulse is thready, heart rate - 120 per minute, BP 70/40 mm Hg.

Questions:

1. Your preliminary diagnosis?
2. Urgent measures and their sequence?
3. What research is needed in the first place?
4. How can you determine the source of bleeding?
5. How can you stop the bleeding in this patient? Are there indications for blood transfusion?
6. What is a biological test, and should it be carried out with blood transfusion?

7. What possible reactions with the infusion of blood substitutes do you know?
8. Classification of blood substitutes

Task 5

The 32-year-old patient after a car accident, complains of severe weakness, lack of air, severe pain in the right half of the chest, aggravated by breathing and coughing. The patient's condition is severe, he is conscious, but inhibited. The skin is pale, cold. NPV -28 per minute Breathing is shallow, on the right is not heard. In the left half of the chest, vesicular breathing is heard, and is carried out in all fields. Heart rate 128 per minute HELL 80/60 mm Hg. On the survey chest X-ray gram there are determined multiple fractures of the ribs on the right side, there the level of fluid is determined at the level of 3 ribs.

Questions:

1. Your suppositional diagnosis.
2. Emergency events and their sequence.
3. What research needs to be done first?
4. What do the changes on the X-ray gram mean?
5. Does the patient need blood transfusion?
6. What is blood reinfusion? Indications and contraindications for its implementation.
7. Calculate the volume of infusion therapy in this patient.
8. Which blood substitutes should be included in the infusion therapy for this patient?
9. What is a biological test and should it be carried out with blood transfusion?

Task 6.

The 24-year-old patient taken to hospital 20 hours after the onset of the disease. He complains of a general sharp weakness, vomiting of the color of coffee grounds.

He considers himself ill for 3 years, when he began to notice the “hungry” epigastric pains that periodically arise in the spring and autumn. He was treated independently. The deterioration occurred two weeks ago, when epigastric pains appeared, which decreased after taking antacids. Two days ago, noticed tarry stool. Objectively, the general condition is satisfactory. Skin and mucous membranes have pale pink color. Pulse - 96 per minute, rhythmic, BP 110/70 mm Hg. The abdomen is not swollen, palpation is slightly painful in the epigastrium and right hypochondriac. Peristalsis is satisfactory, dark-colored stools. In the blood: RBC- 3.5 x 10^{12}/l, Hb - 100 g /l, Ht - 0.34

Questions:

1. Your suppositional diagnosis.
2. What complication is possible in a patient?
3. What necessary instrumental and laboratory examination methods should be performed?
4. Algorithms of your actions.
5. Does the patient need the blood transfusions?
6. Does the patient need the blood substitutes transfusions?
7. What is the external coagulation pathway?
8. 8. What is antithrombin III and its significance in the hemostatic system?
9. What is the significance of heparin in the hemostatic system? What allows it to play such role?

Task 7.

A 28-year-old patient. Uncomplicated pregnancy, 39 weeks. She underwent a caesarean section, which was complicated by massive blood loss of surgical origin. Blood loss was replaced by fresh frozen plasma, erythrocyte concentrate and crystalloid solutions. In 1 hour after the operation, hemorrhagic discharge from the genital tract was noted, moderate soaking of the dressing, petechiae under the blood pressure cuff.

Questions:

1. What complication did the patient have?

2. Stage of the arising pathological process

3. What changes in hemostasis occurred at this stage of the pathological process?

4. Priority diagnostic measures to clarify the nature and stage of the pathological process.

5. Which tubes should be used to study plasma factors of hemostasis and why?

6. What is antithrombin III and its significance in the hemostatic system?

7. What is fibrinogen and its significance in the hemostatic system?

8. What are soluble fibrin-monomer complexes, their diagnostic value?

9. What is D-dimers, their diagnostic value?

10. Name antifibrinolytic agents.

Task 8.

A 60-year-old patient was admitted to the hospital with complaints of severe weakness, a sharp decrease in efficiency, rapid fatigue, and memory loss. From the anamnesis, it was found out that during the last 3 years there has been an excretion of red blood after each defecation. He was treated independently, without effect. In connection with the worsening condition he sought medical help. The state is a moderate severity. The skin is pale, warm. Respiratory rate -18 per minute, with a moderate physical exertion it quickly increases to 24-26 per 1 min. Heart rate 88 1 per min, BP - 105/65 mm Hg. In the blood - RBC - 2.74 * 10^{12} /l, Hb - 76 g /l, Ht - 0.28, MCV -69 fl, MCH - 23.2pg, reticulocytes -9%.

Questions:

1. Your suppositional diagnosis.
2. What is the patient's complication?
3. What instrumental and laboratory tests need to be done?
4. Explain the changes in the blood test.
5. Does the patient have indications for blood transfusion?
6. Does the patient have indications for blood substitutes transfusion?

7. What are the therapeutic measures for the relief of complications arising in the patient?
8. What is the purpose of transfusion of fresh frozen plasma?
9. What are the normal indicators of fibrinogen?
10. What is the external pathway of blood coagulation activation?

Task 9.

Erythrocytes 3.1 x 1012 / l; Hemoglobin 60 g/l; MCH 19.4 pg/l; HCT-0.29; MCV - 93.5 fl; CI (color index) - 0.58; MCHC - 206 g/l; reticulocytes 25%; platelets $200*10^9$/l; leukocytes $5.1*10^9$/l); eosinophils 2%; basophils 0.5%; stab (band) neutrophils 4%; segmented neutrophils 50.5%; lymphocytes 38%; monocytes 5%; ESR 22 mm / h; anisocytosis, poikilocytosis.

Quetions:

1. What is the condition of this hemogram?
2. What are the criteria for iron deficiency anemia?
3. What additional research can be done to clarify the diagnosis?
4. What are the indicators MCV, MCH, MCHC, their normal values?
5. What type of anemia do MCV, MCH, MCHC indicators correspond to and why?

Task 10.

Patient A. was taken to a surgical clinic from a car accident site with multiple injuries and loss of a large amount of blood. The patient was underwent surgery for ligation of bleeding blood vessels, transfused 1200 ml of donated blood (shelf life from 2 to 17 days) and 2000 ml of blood substitutes. In the intensive care unit: the patient's condition is severe, tachycardia, arterial hypotension, shortness of breath, daily diuresis are significantly less than the norm; there was bleeding from small vessels of damaged tissues. Laboratory data: red blood cells 2,2 * 1012 / l; hemoglobin 72.3 g / l; hematocrit - 0.19; platelets 82 * 109 / l; Lee-White clotting

time - 12 minutes; bleeding time - 7 minutes; fibrinogen -1.9 g / l; INR - 1.79. On the second day, acute renal failure phenomena developed. Death was caused by progressive renal and cardiovascular failure. At the autopsy revealed signs of multiple thrombosis of small vessels of internal organs.

Questions:

1. What pathological process has the patient developed: a) shortly after the injury, b) in the intensive care unit?
2. What is the pathogenesis of the pathological process that developed in a patient in the intensive care unit?
3. What are the mechanisms of development: a) renal failure, b) cardiovascular insufficiency in a patient?
4. Transfusion therapy was ineffective. Express the assumption - why?

Questions for the exam:

1. Order of the Ministry of Health of the Russian Federation dated November 25, 2002 No. 363 "On approval of the Instruction for the use of blood components" Significance for the organization of infusion-transfusion therapy.
2. Resolution of the Government of the Russian Federation of January 26, 2010 N 29 "On approval of technical regulations on safety requirements for blood, its products, blood-substituting solutions and technical means used in transfusion-infusion therapy"
3. Order of the Ministry of Health of Russia dated 04/02/2013 N 183n "On approval of the rules for the clinical use of donor blood and (or) its components"
4. Federal law of 20.07.2012 N 125-FL "On the donation of blood and its components"
5. Cryopreservation of blood cells: concept, theoretical justification, basic methods.

6. Medical examination of donors. Contraindications for taking blood from donors.
7. Compatibility tests before blood transfusion, components and blood substitutes.
8. Components of donor blood. Mechanism of action. Indications for transfusion.
9. Blood groups. Antigenic composition of the ABO system. Determination of blood groups by ABO. Recording of results. Errors of determination.
10. Immunological safety of blood transfusions. The concept of compatibility of blood systems ABO and rhesus. Blood transfusion tests.
11. Donor intermittent plasmapheresis. The technique. Equipment for plasmapheresis.
12. Classification of blood substitutes: principle, main groups. Blood substitutes of hemodynamic action. Rules of transfusion.
13. Classification of blood substitutes: principle, main groups. Blood substitutes for parenteral nutrition. Rules of transfusion.
14. Classification of blood substitutes: principle, main groups. Blood substitutes are correctors for acid-base balance and water-salt metabolism. Rules of infusion therapy.
15. Donation. Organization of the blood service. Types of donation. Medical Examination. Contraindications for blood donation.
16. Hemodynamics, definition, physiological regulation. Microcirculation. Transcapillary exchange.
17. Acute blood loss. Classification. Principles of compensation for acute blood loss.
18. Hemorrhagic shock. Pathogenesis. Clinical manifestations . Diagnostics. Treatment. Principles of infusion-transfusion therapy.
19. Traumatic shock. Pathogenesis. Clinical manifestations. Diagnostics. Treatment. Principles of infusion-transfusion therapy.
20. Hypovolemic shock. Pathogenesis. Clinical manifestations. Diagnostics.

Treatment. Principles of infusion-transfusion therapy

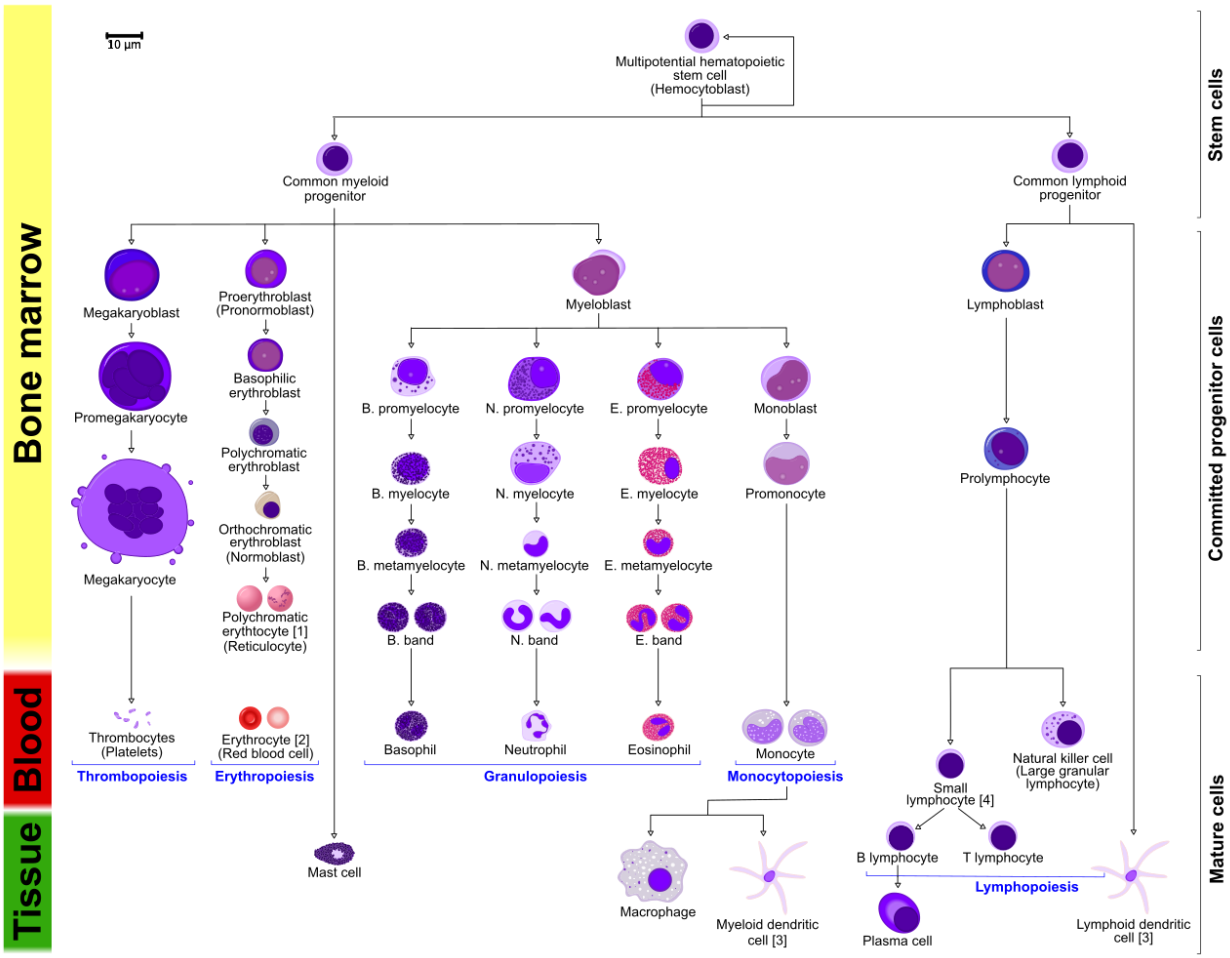
21. Distributive shock. Pathogenesis. Clinical manifestations. Diagnostics. Treatment. Principles of infusion-transfusion therapy
22. Coagulant, anticoagulant and fibrinolytic blood systems. Factors. Diagnosis of the state of these blood systems.
23. Acute DIC syndrome. Etiological causes. Pathogenesis. Diagnosis of the stages of DIC.
24. Acute DIC syndrome. Etiological causes. Pathogenesis. Principles of infusion-transfusion therapy.
25. Chronic DIC. Etiological causes. Pathogenesis. Principles of infusion-transfusion therapy.
26. Chronic anemia. The reasons. Clinical manifestations. Diagnostics. Principles of infusion-transfusion therapy.
27. Hemopoiesis. Stem cell concept. Scheme of hemopoiesis. Hematopoiesis organs
28. Morphology and physiology of blood cells: red blood cells, leukocytes, platelets.
29. Protein composition of blood, the value of protein fractions.
30. Clinical analysis of blood, its main indicators. Interpretation of clinical blood counts.
31. The main biochemical blood parameters (total protein, albumin, bilirubin, urea, creatinine, ALT, AST, ALP, GGTP), their clinical significance. Indicators of the norm.
32. Blood substitutes for parenteral nutrition: definition, basic drugs, mechanism of action.
33. Tests for individual compatibility of blood of the donor and recipient with blood transfusions.
34. Reactions and complications of blood transfusion and its components.
35. Components of donor blood: definition, basic forms, application in clinical practice.

36. Biological test for blood transfusion. Rules. Accounting result. Conducting biological samples under anesthesia. Documentation for blood transfusion.
37. Antigenic composition of the Rh factor. The rules for determining the Rh factor. Errors.
38. Difficult blood types. Their description. Methods for determining difficult-to-determine blood groups.
39. White blood cell concentrate. The method of obtaining. Indications and contraindications for transfusion of leukocyte concentrate. Rules of transfusion.
40. Platelet concentrate. The method of obtaining. Indications and contraindications for platelet transfusion. Rules of transfusion.
41. Tests for individual compatibility of blood donor and recipient with blood transfusions: types, technique.
42. Extracorporal detoxification methods. Indications.
43. Donation. Basic concepts. Types of donation. Categories of donors. History of donation.
44. Infectious complications in transfusiology. Ways to solve the problem
45. Antigenic composition of the blood group in the ABO system. Determination of blood groups by ABO Causes of errors in determining the blood group of the ABO system.
46. Quarantine of blood components as the main method of excluding transmission of blood-transmissible infections. Alternative to quarantine.
47. Modern blood components, indications for transfusion.
48. Endogenous intoxication syndrome. Pathogenesis. Clinic. Diagnostics. Principles of infusion-transfusion therapy.
49. Leukofiltration. Plasma quarantine. Virus-activating plasma. Method of execution. Indications for implementation.
50. Hemocorrection. Classification methods. Sorption methods. Kinds. Performance technique
51. Blood transfusion shock. The reasons. Pathogenesis. Stages of shock.

Wedges

52. Renal and multiple organ failure with incompatible blood transfusion. Causes of occurrence. Treatment methods.
53. Urgent measures in the incompatibility of blood in time of blood transfusion. Principles of infusion therapy in the event of incompatibility with transfused blood.

Indicator	Norm	Prelatent stage IDA	Latent stage IDA	Clinical stage IDA
Red cell morphology	Without changes	Без изменений	Без изменений	Microcytosis and hypochromia
Hemoglobin content	Without changes	Без изменений	110-120 г/л	<110 g / l
Median erythrocyte volume	81-94 microns ’	81-94 мкм’	< 80 мкм’	<80 microns
Serum iron concentration	50-150 μg% (9-27 μmol / l)	50-150 мкг% (9-27 мкмоль/л)	< 50 мкг% (< 9 мкмоль/л)	<30 μg% (<9 μmol / L)
Transferrin saturation	30-50%	30-50%	<30%	<10%
Serum ferritin concentration	50-200 μg / l	< 20 мкг/л	< 15 мкг/л	<15 μg / l
Coloring bone marrow to iron	1-3 +	0-1+	0	0



Показатель	Норма	Прелатентная стадия ЖДА	Латентная стадия ЖДА	Клиническая стадия ЖДА
Морфология эритроцитов	Без изменений	Без изменений	Без изменений	Микроцитоз и гипохромия
Содержание гемоглобина	Без изменений	Без изменений	110–120 г/л	< 110 г/л
Средний эритроцитарный объем	81–94 мкм³	81–94 мкм³	< 80 мкм³	< 80 мкм³
Сывороточная концентрация железа	50–150 мкг% (9–27 мкмоль/л)	50–150 мкг% (9–27 мкмоль/л)	< 50 мкг% (< 9 мкмоль/л)	< 30 мкг% (< 9 мкмоль/л)
Насыщение трансферрина	30–50%	30–50%	< 30%	< 10%
Сывороточная концентрация ферритина	50–200 мкг/л	< 20 мкг/л	< 15 мкг/л	< 15 мкг/л
Окраска костного мозга на железо	1–3+	0–1+	0	0