

**MINISTRY OF HEALTH PROTECTION OF UKRAINE**

**ODESSA NATIONAL MEDICAL UNIVERSITY**

Department of general, pediatric and military surgery with a course of urology

**I APPROVE**

Vice-rector for scientific and pedagogical work

Eduard BURYACHKIVSKY

2024



**CURRICULUM ON EDUCATIONAL DISCIPLINE**

**"Transfusion of blood components and preparations in surgery. The use of modern blood substitutes."**

**Level of higher education:** second (master's degree )

**Field of knowledge:** 22 "Health care"

**Specialty:** 222 "Medicine"

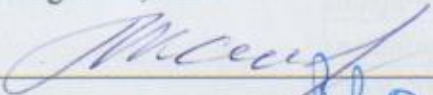
**Educational and professional program :** Medicine

The curriculum is compiled on the basis of the educational and professional program "Medicine" for the training of specialists of the second (master's) level of higher education in the specialty 222 "Medicine" of the field of knowledge 22 "Health care", approved by the Scientific Council of ONMedU (protocol No. 10 of June 27, 2024 ).

Developers: MD, Prof. M.A. Kashtalyan, MD, Assoc. Gerasimenko O.S., MD , Prof. V. E. Vansovich , Ph.D. Assoc. Davydov D.M., Ph.D. , Assoc. S. V. Tsyprovayaz , Ph.D. , Assoc. E.A. Kvasnevskiy , Ph.D. , Assoc. Kvasnevsky O.A., Ph.D., Assoc. Ilyina-Stognienko V.Yu., assistant Bilash O.V.

The program was discussed at a meeting of the department of general, pediatric and military surgery with a urology course

Protocol No. 1 dated August 27, 2024.

Head of the department  Mykhailo KASHTALYAN

Agreed with the guarantor of the EPP  Valery MARICHEREDA

The program was approved at the meeting of the subject cycle commission for surgical disciplines of the ONMedU

Protocol No. 1 dated August 30, 2024.

The head of the subject cycle methodical Committee on Surgical Disciplines  Vasyl MISHCHENKO

Reviewed and approved at the meeting of the department of general pediatric and military surgery with a course of urology and ophthalmology  
Protocol No. 1 of "4" september 2024

Head of the department  Mykhailo KASHTALYAN  
(signature) (First Name Surname)

Reviewed and approved at the meeting of the department

Protocol No. \_\_\_ of "\_\_\_" \_\_\_\_\_ 20\_\_

- GC 1. Ability to discuss thinking, analysis and synthesis
- GC 2. Ability to learn and master previous knowledge
- GC 3. Ability to apply knowledge in practical situations
- GC 4. Knowledge and understanding of the subject area and understanding of professional activity
- GC 5. Ability to adapt and act in a new situation
- GC 7. Ability to work in a team
- GC 17. Ability to evaluate and ensure the quality of performed works

Special GCs:

### 1. Description of the academic discipline :

Name of indicators	Field of knowledge, specialty, specialization, level of higher education	Characteristics of the academic discipline
Total number:	Discipline 22 "Health care"	<i>Full-time education</i> <i>Elective discipline</i>
Credits: 3		<i>Year of training: 3</i>
Hours: 90	Specialty 222 "Medicine"	<i>Semesters V-VI</i> <i>Lectures (0 hours)</i>
Content modules: 4	Level of higher education second (master's )	<i>Seminars (0 hours)</i> <i>Practical (30 hours)</i> <i>Laboratory (0 hours)</i> <i>Independent work (60 hours)</i> <i>including individual tasks (0 hours)</i> <i>Final control form - test</i>

### 2. The purpose and tasks of the educational discipline, competences, program learning outcomes.

**Purpose :** Mastery by the acquirer of knowledge and formation of elements of professional competences in the field of surgery, and improvement of skills and competences acquired during the study of previous disciplines.

**Task:**

1. Formation of skills and abilities: on determination of blood group and Rh blood type, on blood transfusion, use of blood substitutes.
2. Mastering the skills of determining the blood group and Rh-affinity of the blood, performing group, individual and biological compatibility of the donor and the recipient.
3. Mastering the ability to determine tactics with blood transfusions and the use of blood substitutes.

**The process of studying the discipline is aimed at forming elements of the following competencies:**

**Integral competence:** The ability to solve typical and complex problems, including those of a research and innovation nature in the field of medicine. Ability to continue learning with a high degree of autonomy.

**General (GC):**

- GC1. Ability to abstract thinking, analysis and synthesis
- GC 2. Ability to learn and master modern knowledge
- GC 3. Ability to apply knowledge in practical situations
- GC 4. Knowledge and understanding of the subject area and understanding of professional activity
- GC 5. Ability to adapt and act in a new situation
- GC 7. Ability to work in a team
- GC 17. Ability to evaluate and ensure the quality of performed works .

**Special (SC):**

- SC1. Ability to collect medical information about the patient and analyze clinical data
- SC 6. Ability to determine the principles and nature of treatment and prevention of diseases
- SC 8. Ability to determine tactics and provide emergency medical care
- SC 10. Ability to perform medical manipulations
- SC 16. Ability to fill medical documentation, including electronic forms
- SC 24. Adherence to ethical principles when working with patients and laboratory animals

**Program learning outcomes (PLO):**

PLO 1. Having a thorough knowledge of the structure of professional activity. Being able to carry out professional activities that require updating and integration of knowledge. To be responsible for professional development, the ability for further professional training with a high level of autonomy.

PLO 17. Performing medical manipulations (according to list 5) in the conditions of a medical institution, at home or work based on a previous clinical diagnosis and/or indicators of the patient's condition by making a reasoned decision, observing the relevant ethical and legal norms.

PLO 24. Organization of the necessary level of individual safety (own and the persons he cares for) in case of typical dangerous situations in the individual field of activity.

**As a result of studying the academic discipline, the student of higher education must:**

**To know:** antigenic systems of human blood, determination of blood group and Rhesus belongingness of human blood, determination of group, individual and biological compatibility of donor and recipient, use of modern blood substitutes.

**Be able:**

- Perform medical manipulations (according to list 5) in the conditions of a medical institution, at home or at work based on a previous clinical diagnosis and/or indicators of the patient's condition by making a reasoned decision, observing the relevant ethical and legal norms.
- To organize the necessary level of individual safety (own and the persons he cares for) in case of typical dangerous situations in the individual field of activity.

**3. Content of the academic discipline**

**TRANSFUSION OF BLOOD COMPONENTS AND PRODUCTS. USE OF MODERN BLOOD SUBSTITUTES.**

**Content module 1. Physiology of blood.**

**Topic 1. Blood as tissue.**

The structure of blood. Blood physiology. Blood functions. Functions of individual components of blood.

**Topic 2. Antigenic systems of blood.**

Antigenic systems of blood. Cell and plasma antigenic systems. AB0 and Rh -factor system. Ottenberg's rule.

**Content module 2. Transfusion of blood components and preparations.**

**Topic 3. Determination of blood group.**

Agglutination reaction. Methods of blood group determination according to the AB0 system. The method of monoclonal antibodies. Method of standard erythrocytes. Cross method. Determination of Rh belonging to the blood. The method of determining the Rh identity of blood using monoclonal antibodies (tsoliclones). Errors in blood group determination.

**Topic 4. Blood components and preparations.**

Classification of transfusion media. Blood components: erythrocytes, thrombocyte concentrate, leukocyte concentrate, fresh frozen plasma, cryoprecipitate. Blood preparations: hemostasis correctors, immunological preparations, complex preparations. Indications for use.

**Topic 5. Blood transfusion.**

Blood transfusion, absolute and relative indications and contraindications. Ways and methods of blood transfusion. Technique of transfusion of blood components and preparations. Obligatory studies when transfusion of blood components and preparations.

**Topic 6. Conducting a hemotransfusion operation.**

Macroscopic evaluation of the suitability of the transfusion medium. Testing for compatibility. Hemotransfusion operation. Posttransfusion supervision. Medical documentation.

**Topic 7. Complications of blood transfusion.**

Classification of hemotransfusion complications by nature of occurrence. Complications of a mechanical nature. Reasons. Clinical manifestations. Treatment.

**Topic 8. Complications of a reactive nature.**

Nonhemolytic febrile reactions. Reasons. Clinical manifestations. Treatment. Allergic reactions. Reasons. Clinical manifestations. Treatment.

**Topic 9. Complications of a reactive nature. Hemotransfusion shock.**

Hemotransfusion shock. Causes of occurrence. Clinical manifestations. Periods of the clinical course of hemotransfusion shock. Prevention of hemotransfusion shock. Treatment of hemotransfusion shock.

**Topic 10. Complications of a reactive nature.**

Syndrome of massive blood transfusions. Definition. Reasons. Clinical manifestations. Treatment. Acute post-transfusion lung injury syndrome. Definition. Reasons. Clinical manifestations. Treatment.

**Topic 11. Reinfusion of blood.**

Blood reinfusion, indications and contraindications. Reinfusion technique. Possible complications.

**Topic 12. Autohemotransfusion. Donation**

Methods of collecting one's own blood. Basics of legislation on donation issues. Types of donation. Groups of donors.

**Content module 3. Use of modern blood substitutes.**

**Topic 13. Blood substitutes.**

Classification of blood substitutes. Blood substitutes of hemodynamic action. Detoxification drugs. Preparations for parenteral nutrition. Regulators of water-salt and acid-base conditions. Preparations with the function of oxygen transfer. Blood substitutes of complex action, biodegradable. Indications for use.

**Topic 14. The use of blood substitutes, blood components and preparations in intensive therapy for hemorrhagic and burn shock.**

Hemorrhagic shock. Definition. Methods of determining the volume of blood loss. Degrees of severity of hemorrhagic shock. Calculation of the volume of resuscitation depending on the degree of volume of blood loss. Burn shock. Definition. Damage severity index. Degrees of severity of burn shock. Parkland formula of infusion therapy in adults.

**Content module 4. Practical skills in transfusiology.**

**Topic 15. Control of learning practical skills.**

Determine the blood group according to the AB 0 system by the method of monoclonal antibodies. Define Rh - blood factor by the method of monoclonal antibodies. Carrying out a macroscopic assessment of the suitability of donor erythrocytes. Conducting a blood group compatibility test of the donor and the recipient. Carrying out a test for the individual compatibility of the blood of

the donor and the recipient. Carrying out a test for the biological compatibility of the blood of the donor and the recipient. Fill out the medical form 003-5/o "Protocol of transfusion of blood and its components".

#### 4. The structure of the academic discipline

Names of topics	Number of hours					
	In total	Including				
		Lectures	Seminars	Practical	Laboratory	IWS
<b>Content module 1. Physiology of blood.</b>						
Topic 1. Blood as tissue. The structure of blood. Blood physiology. Blood functions. Functions of individual components of blood.	6	0	0	2	0	4
Topic 2. Antigenic systems of blood. Antigenic systems of blood. Cell and plasma antigenic systems. AB0 and Rh -factor system. Ottenberg's rule.	6	0	0	2	0	4
<i>Together according to content module 1</i>	12	0	0	4	0	8
<b>Content module 2. Transfusion of blood components and preparations.</b>						
Topic 3. Determination of blood group. Agglutination reaction. Methods of blood group determination according to the AB0 system. The method of monoclonal antibodies. Method of standard erythrocytes. Cross method. Determination of Rh belonging to the blood. The method of determining the Rh identity of blood using monoclonal antibodies (tsoliclones). Errors in blood group determination.	6	0	0	2	0	4
Topic 4. Blood components and preparations. Classification of transfusion media. Blood components: erythrocytes, thrombocyte concentrate, leukocyte concentrate, fresh frozen plasma, cryoprecipitate.	6	0	0	2	0	4

Blood preparations: hemostasis correctors, immunological preparations, complex preparations. Indications for use.						
Topic 5. Blood transfusion. Blood transfusion, absolute and relative indications and contraindications. Ways and methods of blood transfusion. Technique of transfusion of blood components and preparations. Mandatory studies when transfusion of blood components and preparations.	6	0	0	2	0	4
Topic 6. Conducting a hemotransfusion operation. Macroscopic evaluation of the suitability of the transfusion medium. Testing for compatibility. Hemotransfusion operation. Posttransfusion supervision. Medical documentation.	6	0	0	2	0	4
Topic 7. Complications of blood transfusion. Classification of hemotransfusion complications by nature of occurrence. Complications of a mechanical nature. Reasons. Clinical manifestations. Treatment.	6	0	0	2	0	4
Topic 8. Complications of a reactive nature. Nonhemolytic febrile reactions. Reasons. Clinical manifestations. Treatment. Allergic reactions. Reasons. Clinical manifestations. Treatment.	6	0	0	2	0	4
Topic 9. Complications of a reactive nature. Hemotransfusion shock. Hemotransfusion shock. Causes of occurrence. Clinical manifestations. Periods of the clinical course of hemotransfusion shock. Prevention of	6	0	0	2	0	4

hemotransfusion shock. Treatment of hemotransfusion shock.						
Topic 10. Complications of a reactive nature. Syndrome of massive blood transfusions. Definition. Reasons. Clinical manifestations. Treatment. Acute post-transfusion lung damage syndrome. Definition. Reasons. Clinical manifestations. Treatment.	6	0	0	2	0	4
Topic 11. Reinfusion of blood. Blood reinfusion, indications and contraindications. Reinfusion technique. Possible complications.	6	0	0	2	0	4
Topic 12. Autohemotransfusion. Donation Methods of harvesting one's own blood. Basics of legislation on donation issues. Types of donation. Groups of donors.	6	0	0	2	0	4
<i>Together according to content module 2</i>	60	0	0	20	0	40
<b>Content module 3. Use of modern blood substitutes.</b>						
Topic 13. Blood substitutes. Classification of blood substitutes. Blood substitutes of hemodynamic action. Detoxification drugs. Preparations for parenteral nutrition. Regulators of water-salt and acid-base conditions. Preparations with the function of oxygen transfer. Blood substitutes of complex action, biodegradable. Indications for use.	6	0	0	2	0	4
Topic 14. The use of blood substitutes, blood components and preparations in intensive therapy for hemorrhagic and burn shock. Hemorrhagic shock. Definition. Methods of	6	0	0	2	0	4



determining the volume of blood loss. Degrees of severity of hemorrhagic shock. Calculation of the volume of resuscitation depending on the degree of volume of blood loss. Burn shock. Definition. Damage severity index. Degrees of severity of burn shock. Parkland formula of infusion therapy in adults.						
<i>Together according to content module 3</i>	12	0	0	4	0	8
<b>Content module 4. Practical skills in transfusiology.</b>						
Topic 15. Control of learning practical skills. Determine the blood group according to the AB0 system by the method of monoclonal antibodies. Determine the Rh blood factor by the monoclonal antibody method. Carrying out a macroscopic assessment of the suitability of donor erythrocytes. Conducting a blood group compatibility test of the donor and the recipient. Carrying out a test for the individual compatibility of the blood of the donor and the recipient. Carrying out a test for the biological compatibility of the blood of the donor and the recipient. Fill out the medical form 003-5/o "Protocol of transfusion of blood and its components".	6	0	0	2	0	4
<i>Together according to content module 4</i>	6	0	0	2	0	4
Test.	0	0	0	0	0	0
<b>Total : hours:</b>	90	0	0	30	0	60

## 5. Topics of lectures / seminars / practical / laboratory classes

### 5.1. Topics of lectures

Lectures are not provided.

### 5.2. Topics of seminar classes

Seminar classes are not provided.

### 5.3. Topics of practical classes

No	Topic name	How many hours?
1	Topic 1. Practical class 1. Blood is like tissue. The structure of blood. Blood physiology. Blood functions. Functions of individual components of blood.	2
2.	Topic 2. Practical class 2. Antigenic systems of blood. Antigenic systems of blood. Cell and plasma antigenic systems. ABO and Rh-factor system. Ottenberg's rule.	2
3	Topic 3. Practical class 3. Determination of blood group. Agglutination reaction. Methods of blood group determination according to the ABO system. The method of monoclonal antibodies. Method of standard erythrocytes. Cross method. Determination of Rh belonging to the blood. The method of determining the Rh identity of blood using monoclonal antibodies (tsoliclones). Errors in blood group determination.	2
4	Topic 4. Practical class 4. Components and preparations of blood. Classification of transfusion media. Blood components: erythrocytes, thrombocyte concentrate, leukocyte concentrate, fresh frozen plasma, cryoprecipitate. Blood preparations: hemostasis correctors, immunological preparations, complex preparations. Indications for use.	2
5	Topic 5. Practical class 5. Blood transfusion. Blood transfusion, absolute and relative indications and contraindications. Ways and methods of blood transfusion. Technique of transfusion of blood components and preparations. Obligatory studies when transfusion of blood components and preparations.	2
6	Topic 6. Practical class 6. Hemotransfusion operation. Macroscopic evaluation of the suitability of the transfusion medium. Testing for compatibility. Hemotransfusion operation. Posttransfusion supervision. Medical documentation.	2
7	Topic 7. Practical class 7. Complications of blood transfusion. Classification of hemotransfusion complications by nature of occurrence. Complications of a mechanical nature. Reasons. Clinical manifestations. Treatment.	2
8	Topic 8. Practical class 8. Reactive complication. Nonhemolytic febrile reactions. Reasons. Clinical manifestations. Treatment. Allergic reactions. Reasons. Clinical manifestations. Treatment.	2
9.	Topic 9. Practical class 9. Reactive complication. Hemotransfusion shock.	2

	Hemotransfusion shock. Causes of occurrence. Clinical manifestations. Periods of the clinical course of hemotransfusion shock. Prevention of hemotransfusion shock. Treatment of hemotransfusion shock.	
10.	Topic 10. Practical class 10. Reactive complications. Syndrome of massive blood transfusions. Definition. Reasons. Clinical manifestations. Treatment. Acute post-transfusion lung damage syndrome. Definition. Reasons. Clinical manifestations. Treatment.	2
11.	Topic 11. Practical class 11. Reinfusion of blood. Blood reinfusion, indications and contraindications. Reinfusion technique. Possible complications.	2
12.	Topic 12. Practical class 12. Autohemotransfusion. Donation Methods of harvesting one's own blood. Basics of legislation on donation issues. Types of donation. Groups of donors.	2
13.	Topic 13. Practical class 13. Blood substitutes. Classification of blood substitutes. Blood substitutes of hemodynamic action. Detoxification drugs. Preparations for parenteral nutrition. Regulators of water-salt and acid-base conditions. Preparations with the function of oxygen transfer. Blood substitutes of complex action, biodegradable. Indications for use.	2
14.	Topic 14. Practical class 14. The use of blood substitutes, blood components and preparations in intensive therapy for hemorrhagic and burn shock. Hemorrhagic shock. Definition. Methods of determining the volume of blood loss. Degrees of severity of hemorrhagic shock. Calculation of the volume of resuscitation depending on the degree of volume of blood loss. Burn shock. Definition. Damage severity index. Degrees of severity of burn shock. Parkland formula of infusion therapy in adults.	2
15.	Topic 15. Practical class 15. Control of learning practical skills. Determine the blood group according to the AB0 system by the method of monoclonal antibodies. Determine the Rh blood factor by the monoclonal antibody method. Carrying out a macroscopic assessment of the suitability of donor erythrocytes. Conducting a blood group compatibility test of the donor and the recipient. Carrying out a test for the individual compatibility of the blood of the donor and the recipient. Carrying out a test for the biological compatibility of the blood of the donor and the recipient. Fill out the medical form 003-5/o "Protocol of transfusion of blood and its components".	2
	Together	30

#### 5.4. Laboratory topics classes

Laboratory classes are not provided .

#### 6. Independent work of a student of higher education

No	Title of the topic / types of tasks	How many
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		hours?
1.	Topic 1. Preparation for practical class 1 Blood is like tissue. The structure of blood. Blood physiology. Blood functions. Functions of individual components of blood.	4
2.	Topic 2. Preparation for practical class 2 Antigenic systems of blood. Antigenic systems of blood. Cell and plasma antigenic systems. AB0 and Rh-factor system. Ottenberg's rule.	4
3.	Topic 3. Preparation for practical class 3 Determination of blood group. Agglutination reaction. Methods of blood group determination according to the AB0 system. The method of monoclonal antibodies. Method of standard erythrocytes. Cross method. Determination of Rh belonging to the blood. The method of determining the Rh identity of blood using monoclonal antibodies (tsoliclones). Errors in blood group determination.	4
4.	Topic 4. Preparation for practical class 4 Components and preparations of blood. Classification of transfusion media. Blood components: erythrocytes, thrombocyte concentrate, leukocyte concentrate, fresh frozen plasma, cryoprecipitate. Blood preparations: hemostasis correctors, immunological preparations, complex preparations. Indications for use.	4
5.	Topic 5. Preparation for practical class 5 Blood transfusion. Blood transfusion, absolute and relative indications and contraindications. Ways and methods of blood transfusion. Technique of transfusion of blood components and preparations. Obligatory studies when transfusion of blood components and preparations.	4
6.	Topic 6. Preparation for practical class 6 Hemotransfusion operation. Macroscopic evaluation of the suitability of the transfusion medium. Testing for compatibility. Hemotransfusion operation. Posttransfusion supervision. Medical documentation.	4
7.	Topic 7. Preparation for practical class 7 Complications of blood transfusion. Classification of hemotransfusion complications by nature of occurrence. Complications of a mechanical nature. Reasons. Clinical manifestations. Treatment.	4
8.	Topic 8. Preparation for practical class 8 Reactive complications. Nonhemolytic febrile reactions. Reasons. Clinical manifestations. Treatment. Allergic reactions. Reasons. Clinical manifestations. Treatment.	4
9.	Topic 9. Preparation for practical class 9 Reactive complication. Hemotransfusion shock. Hemotransfusion shock. Causes of occurrence. Clinical manifestations. Periods of the clinical course of hemotransfusion shock. Prevention of hemotransfusion shock. Treatment of hemotransfusion shock.	4
10.	Topic 10. Preparation for practical class 10 Reactive complication. Syndrome of massive blood transfusions. Definition. Reasons. Clinical	4

	manifestations. Treatment. Acute post-transfusion lung injury syndrome. Definition. Reasons. Clinical manifestations. Treatment.	
11.	Topic 11. Preparation for practical class 11 Reinfusion of blood. Blood reinfusion, indications and contraindications. Reinfusion technique. Possible complications.	4
12.	Topic 12. Preparation for practical class 12 Autohemotransfusion. Donation Methods of harvesting one's own blood. Basics of legislation on donation issues. Types of donation. Groups of donors.	4
13.	Topic 13. Preparation for practical class 13 Blood substitutes. Classification of blood substitutes. Blood substitutes of hemodynamic action. Detoxification drugs. Preparations for parenteral nutrition. Regulators of water-salt and acid-base states. Preparations with the function of oxygen transfer. Blood substitutes of complex action, biodegradable. Indications for use.	4
14.	Topic 14. Preparation for practical class 14 The use of blood substitutes, blood components and preparations in intensive therapy for hemorrhagic and burn shock. Hemorrhagic shock. Definition. Methods of determining the volume of blood loss. Degrees of severity of hemorrhagic shock. Calculation of the volume of resuscitation depending on the degree of volume of blood loss. Burn shock. Definition. Damage severity index. Degrees of severity of burn shock. Parkland formula of infusion therapy in adults.	4
15.	Topic 15. Preparation for practical class 15 Control of learning practical skills. Determine the blood group according to the AB0 system by the method of monoclonal antibodies. Determine the Rh blood factor by the monoclonal antibody method. Carrying out a macroscopic assessment of the suitability of donor erythrocytes. Conducting a blood group compatibility test of the donor and the recipient. Carrying out a test for the individual compatibility of the blood of the donor and the recipient. Carrying out a test for the biological compatibility of the blood of the donor and the recipient. Fill out the medical form 003-5/o "Protocol of transfusion of blood and its components".	4
	<b>Together</b>	<b>60</b>

## 7. Teaching methods

**Practical classes:** conversation, solving clinical situational problems, demonstration and practice of manipulation skills according to list 5, instruction and practice of skills on simulation dummies.  
**Independent work:** independent work with the textbook, independent solution of clinical tasks.

## 8. Forms of control and assessment methods (including criteria for evaluating learning outcomes )

**Current control:** oral survey, testing, assessment of performance of practical skills, solution of situational clinical tasks, assessment of activity in class.

**Final control :** test.

**The structure of the current evaluation in the practical class :**

1. Evaluation of theoretical knowledge on the subject of the class:
  - methods: survey, solving a situational clinical problem;
  - the maximum score is 5, the minimum score is 3, the unsatisfactory score is 2.
2. Evaluation of practical skills and manipulations on the subject of the class:
  - methods: assessment of the correctness of the performance of practical skills
  - the maximum score is 5, the minimum score is 3, the unsatisfactory score is 2.

**Current assessment criteria for practical training:**

Rating	Evaluation criteria
Perfectly "5"	The applicant is fluent in the material, takes an active part in discussing and solving a situational clinical problem, confidently demonstrates practical skills and interpretations of clinical, laboratory and instrumental research data, expresses his opinion on the subject of the lesson, demonstrates clinical thinking.
Good "4"	The applicant has a good command of the material, participates in the discussion and solution of a situational clinical problem, demonstrates practical skills and interpretations of clinical, laboratory and instrumental research data with some errors, expresses his opinion on the subject of the lesson, demonstrates clinical thinking.
Satisfactorily "3"	The applicant does not have sufficient knowledge of the material, is unsure of participating in the discussion and solution of a situational clinical problem, demonstrates practical skills and interpretations of clinical, laboratory and instrumental research data with significant errors.
Unsatisfactorily "2"	The applicant does not possess the material, does not participate in the discussion and solution of the situational clinical problem, does not demonstrate practical skills and interpretation of clinical, laboratory and instrumental research data.

Credit is given to the applicant who completed all tasks of the work program of the academic discipline, took an active part in practical classes, completed and defended an individual assignment and has an average current grade of at least 3.0 and has no academic debt.

Test carried out: at the last lesson before the beginning of the examination session - at ribbon system teaching, on to the last occupation - with a cyclical system of education. The credit score is the arithmetic average of all components on a traditional four-point scale and has a value that is rounded using the statistics method with two decimal places after the decimal point.

**9. Distribution of points received by students of higher education**

The obtained average score for the academic discipline for applicants who have successfully mastered the work program of the academic discipline is converted from a traditional four-point scale to points on a 200-point scale, as shown in the table:

**Conversion table of a traditional assessment into a multi-point scale**

Traditional four-point scale	Multipoint 200-point scale
Excellent ("5")	185 - 200
Good ("4")	151 - 184
Satisfactory ("3")	120-150
Unsatisfactory ("2")	Below 120

Multi-point scale (200-point scale) characterizes the actual success rate of each applicant

in mastering the educational component. The conversion of the traditional grade (average score for the academic discipline) into a 200-point grade is performed by the information and technical department of the University.

According to the obtained points on a 200-point scale, the achievements of the applicants are evaluated according to the ECTS rating scale. Further ranking according to the ECTS rating scale allows you to evaluate the achievements of students from the educational component who are studying in the same course of the same specialty, according to the points they received.

The ECTS scale is a relative-comparative rating, which establishes the applicant's belonging to the group of better or worse among the reference group of fellow students (faculty, specialty). An "A" grade on the ECTS scale cannot be equal to an "excellent" grade, a "B" grade to a "good" grade, etc. When converting from a multi-point scale, the limits of grades "A", "B", "C", "D", "E" according to the ECTS scale do not coincide with the limits of grades "5", "4", "3" according to the traditional scale. Acquirers who have received grades of "FX" and "F" ("2") are not included in the list of ranked acquirers. The grade "FX" is awarded to students who have obtained the minimum number of points for the current learning activity, but who have not passed the final examination. A grade of "F" is assigned to students who have attended all classes in the discipline, but have not achieved a grade point average (3.00) for the current academic activity and are not admitted to the final examination.

Applicants who study on one course (one specialty), based on the number of points scored in the discipline, are ranked on the ECTS scale as follows:

**Conversion of the traditional grade from the discipline and the sum of points on the ECTS scale**

<b>Evaluation on the ECTS scale</b>	<b>Statistical indicator</b>
A	Top 10% achievers
B	The next 25% of earners
C	The next 30% of earners
D	The next 25% of earners
E	The next 10% of earners

**10. Methodological support**

- Curriculum of the academic discipline
- Syllabus of the academic discipline
- Situational clinical tasks
- Methodical development of practical classes

**11. Questions for preparing for the final inspection**

1. Modern requirements for hemotransfusion therapy.
2. Erythrocyte antigenic system AB0.
3. Rh factor antigenic system .
4. Methods of blood group determination according to the AB0 system.
5. The method of determining the Rh belonging of the blood.
6. The method of determining the blood group according to the AB0 system by the method of monoclonal antibodies (tsoliclones).
7. The method of determining the blood group according to the AB0 system by the method of standard erythrocytes.
8. The method of determining the blood group according to the AB0 system by the cross method.

9. Errors in blood group determination.
10. Blood components.
11. Blood preparations.
12. General indications and contraindications for transfusion of blood components and preparations.
13. Indications for erythrocyte transfusion.
14. Definition of "fresh frozen plasma" and indications for its use.
15. Definition of "platelet concentrate" and indications for its use.
16. Indications for albumin transfusion.
17. Macroscopic evaluation of the transfusion medium.
18. Methodology of testing for group compatibility of donor and recipient blood.
19. The method of conducting a test for the individual compatibility of the blood of the donor and the recipient.
20. The technique of performing a biological test for compatibility during transfusion.
21. Posttransfusion supervision.
22. Complications of hemotransfusion of a reactive nature.
23. Complications of hemotransfusion of a mechanical nature.
24. Hemotransfusion shock.
25. Massive hemotransfusion syndrome.
26. Acute post-transfusion lung injury syndrome.
27. Blood reinfusion, indications and contraindications.
28. Reinfusion technique.
29. Autohemotransfusion. Methods of harvesting one's own blood.
30. Types of donation. Groups of donors.
31. Classification of blood substitutes.
32. Blood substitutes of hemodynamic action.
33. Detoxification drugs.
34. Preparations for parenteral nutrition.
35. Regulators of water-salt and acid-base states.
36. Preparations with the function of oxygen transfer.
37. Blood substitutes of complex action, biodegradable.

#### **List of practical skills**

1. Determine the blood group according to the AB0 system by the method of monoclonal antibodies.
2. Determine the Rh factor of the blood by the method of monoclonal antibodies.
3. Carrying out a macroscopic assessment of the suitability of donor erythrocytes.
4. Conducting a blood group compatibility test of the donor and the recipient.
5. Carrying out a test for the individual compatibility of the blood of the donor and the recipient.
6. Carrying out a test for the biological compatibility of the blood of the donor and the recipient.
7. Fill out the medical form 003-5/o "Protocol of transfusion of blood and its components".

#### **12. Recommended literature**

##### **Main:**

1. General Surgery. Textbook for students of higher medical educational establishments / [ Lihonenko O.V., Zubaha A.B., Khimich S.D et al.]; Edited by Prof. S.D. Khimich, Prof. M.D. Zheliba / Kyiv AUS Medicine Publishing, 2019.- 608 p.



2. General Surgery. Textbook for students of higher medical educational establishments / [ Lihonenko O.V., Chorna I.O. et all.]; Edited by Prof. Ja.S.Bereznickij, M.P.Zacharash, M.P.Mishalov./ - Vinnica: New book- 2019. -344с
3. R.Kushnir. Lecture of General surgery for foreign students of II and III years of medical faculty. –Ternopil “Ukrmedkniga”,2018 – 318 p

1. Загальна хірургія: підручник / С. Д. Хіміч, М. Д. Желіба, , І. Г. Герич та ін.: за ред. професорів С. Д. Хіміча, М.Д. Желіби,. – К.: ВСВ «Медицина», 2018. – 608 с.
2. Загальна хірургія : [підручник для студентів вищих навч. закладів МОЗ України] / за ред.: Я. С. Березницького, М. П. Захараша, В. Г. Мішалова, В. О. Шідловського ; В. П. Андрющенко, Я. С. Березницький, А. В. Верба та ін. - Вінниця : Нова Книга, 2018. - 342 с.
3. Хірургія. (Підручник з загальної хірургії) /за ред.проф.Я.С.Березницького. – Дніпропетровськ, РВА „Дніпро VAL”, Т.1. – 2018. – 443с.

#### **Additional:**

1. Butyrsky A. General surgery. - Simferopol. 2014. - 478 p
2. General surgery. Selected lectures Edited by prof. V. V. Mishchenko // V. Ye. Vansovych, N. D. Voloshenkova, D. M. Davydov, et other// Odessa 2019. 338p
3. Gostishcev V.K. General surgery/ The manual. –М.:Geotar-med, 2018. 220p

1. Невідкладні стани в хірургії. /Навчальний посібник для медичних ВНЗ I—III рівнів акредитації МОЗ України/ К. Бобак, А. Бобак, В. Киретов - Київ ВСВ «Медицина» - 2017 – 560с.

### **13. Electronic information resources**

1. <https://moz.gov.ua/> - Ministry of Health of Ukraine
2. [www.ama-assn.org](http://www.ama-assn.org) - American Medical Association / American Medical Association
3. [www.who.int](http://www.who.int) - World Health Organization
4. [www.dec.gov.ua/mtd/home/](http://www.dec.gov.ua/mtd/home/) - State Expert Center of the Ministry of Health of Ukraine
5. <http://bma.org.uk> - British Medical Association
6. <http://iss-sic.com/> - International Society of Surgeons