

**MINISTRY OF HEALTH OF UKRAINE
POLTAVA STATE MEDICAL UNIVERSITY**

Department of general surgery with care of the patient

**METHODICAL INSTRUCTIONS
FOR STUDENT SELF-DIRECTED WORK
WHEN PREPARING FOR AND DURING TO THE PRACTICAL CLASS**

Study discipline	General surgery
Module №1	INTRODUCTION TO SURGERY. SURGICAL EMERGENCY CONDITIONS. FUNDAMENTALS OF ANESTHESIOLOGY AND INTENSIVE CARE
<i>Content module 2.</i>	<i>Bleeding, blood loss. Bases of blood transfusion</i>
<i>Lesson theme 8</i>	Operation of blood transfusion. Features of transfusion of various components of blood and blood substitutes.
Years of study	<i>III</i>
Faculty	International

Poltava

Content module 2.	Bleeding, blood loss. Basics of haemotransfusiology.
<i>Lesson theme №8</i>	Operation of blood transfusion. Features of transfusion of various components of blood and blood substitutes

1. Relevance of the topic:

The transfusion of blood - is the most common operation for tissue transplantation from a healthy patient with a medical purpose . Blood transfusions can be applied in different circles of medicine: surgery , internal medicine , obstetrics and gynecology , etc. Therefore, blood transfusion equipment must possess a doctor . The ability to correctly identify screenings for transfusion , to determine the blood group and Rh affiliation , to test for compatibility of blood, which is poured - is vitally important to the patient.

For mistakes made by blood transfusion , responsible doctor who received a blood transfusion . Therefore, the sample for compatibility , availability of blood and serum should be able to control every doctor . These are the main requirements of prevention of the most dangerous complications and post-transfusion reactions that snevozmogayut tragic consequences.

2 . Learning Objectives :

1. Know the history of blood transfusion .
- 2 . Know screenings for transfusion .
- 3 . Know the types of blood transfusions .
- 4 . To know the way of blood transfusions .
- 5 . Know the methods of blood transfusions .
6. Know the mechanism of action of transfused blood and blood products .

3 . Basic knowledge and skills necessary for studying the topic (inter-disciplinary integration)

The names of the preceding disciplines	The skills
normal physiology	Know the features of the functioning of the hematopoietic and cardiovascular system. Know the normal parameters of a general analysis of blood and urine tests.
normal anatomy	Determine the type of vessel. Know the structure of the main types of vessels.
Physical and Colloid Chemistry	Know the concept of osmotic and oncotic pressure.
Propedeutics Internal Medicine	To demonstrate the method of examination of patients, collecting medical history, conduct inspection, palpation, percussion and auscultation, reading radiographs.

pathophysiology	Know the pathogenesis of hypovolemic shock, blood disorders, DIC, to be able to diagnose shock.
Biochemistry	To treat blood biochemistry.
pathological anatomy	Histopathological signs of bleeding

The student must have an idea :

- The indications and contraindications for transfusion of blood and blood components , assimilate methods of blood transfusion .
- A blood transfusion and monitoring of patients during its execution .

The student should know :

1. Indications and contraindications for transfusion .
2. The mechanism of action of transfused blood and blood components.
3. Ways and methods of blood transfusion .
4. Autologous blood transfusion
5. Reinfusion, indication, contraindication
6. Direct blood transfusion.
7. Indirect blood transfusion
8. Exchange transfusion
9. Technique of the venesection
10. Technology blood transfusion
11. Tests for compatibility before haemotransfusion
12. Monitoring of patients after blood transfusion

The student should be able to:

1. Be able to define the indications and contraindications for transfusion of blood and blood components , blood transfusion techniques to learn .
- 2 . Organize a blood transfusion and monitoring of patients during its execution .
- 3 . To do test for compatibility

Mastering the skills of students:

1. Macroscopic determination of the quality of blood.
- 2 . Observation of the patient during the transfusion , documentation.
- 3 . Determination of blood groups and conduct tests for compatibility.

4. Tasks for self-study in preparation for the lesson .

4.1. The list of basic terms , parameters, characteristics that must learn student in preparation for the class:

term	definition
autohemotransfusion	The transfusion of his own blood.
refusion	Direct transfusion of fresh his own blood from the site of bleeding.
hemostasis	Stop the bleeding.
coagulation	Blood clotting.

coagulopathy	Disruption in the blood coagulation system.
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4.2 . Theoretical questions for the class :

1. . Indications and contraindications for transfusion .
2. The mechanism of action of transfused blood and blood components.
3. Ways and methods of blood transfusion .
4. Autologous blood transfusion
5. Reinfusion, indication, contraindication
6. Direct blood transfusion.
7. Indirect blood transfusion
8. Exchange transfusion
9. Technique of the venesection
10. Technology blood transfusion
11. Tests for compatibility before haemotransfusion
12. Monitoring of patients after blood transfusion

4.3. Practical skill (tasks) used in class:

1. Macroscopic determination of the quality of blood.
- 2 . Observation of the patient during the transfusion , documentation.
- 3 . Determination of blood groups and conduct tests for compatibility.

5 . The content of the topic.

METHODS TRANSFUSION

In clinical practice, distinguish the following methods of blood transfusion :

1. Direct transfusion of blood from one person to another (homologous transfusion)
- 2 . Reinfusion of their own blood or blood components - recycling transfusion patient, which resulted in different cavities (abdominal , thoracic) during surgery or trauma.
- 3 . Autohemotransfusion - banked blood transfusion patient prematurely harvested .
4. Exchange transfusion - transfusion of stored blood , with simultaneous exchange of the patient's blood .
- 5 . Indirect blood transfusion - transfusion of stored blood .

Direct blood transfusion.

It is defined as a direct transfusion of blood from the donor to the recipient without the use of anticoagulants regardless of the method of transfusion . This can be achieved by conventional syringes and their numerous modifications and using special equipment . The disadvantages include the following way :

- Need for special equipment ;
- Syringes, transfusion of the necessary involvement of several persons ;
- To prevent clotting of blood transfusions are all jet ;
- The donor must be located next to the sick ;

- Even when using the most modern equipment is the risk of contamination with infected blood donor patient. At this time, this method is not widely applied because of the three

Reinfusion - his blood transfusion to the patient , which resulted in serous cavities during surgery (thoracic , abdominal) , in violation of tubal pregnancy , rupture of the spleen , parenchymal injuries of the chest , abdomen . Blood is poured into the cavity of the body is different in composition from the circulating blood. It decreased platelet count, fibrinogen , 2, 3- diphosphoglycerate , a high level of free hemoglobin , fibrinogen degradation products present . To some extent, these disadvantages are offset during the mandatory money before reinfusion of red blood cells .

Previously, blood was collected from the cavity of a ladle or spoon - by aspiration into the vessel passed through eight layers of gauze soaked in a 4% solution of sodium citrate . At this time, like filtering the blood, which is poured out , is unacceptable! Proposed a special automatic device , which allows to suck blood from the cavity which is then fed through a filter with pores of 120 micrometers in a sterile tank. Reinfusion of blood collected for at least 6 hours from the time of the outpouring of it in the cavity. The use of intraoperative blood reinfusion shown only in cases where the foresight of blood loss exceeds 20 % of circulating blood volume . This can be in the cardiovascular surgery at break of ectopic pregnancy, orthopedic surgery, traumatology. Intraoperative reinfusion Contraindications bakterilnom contamination of blood enters the amniotic fluid , in the absence of the possibility of laundering the blood that poured out during the operation.

Autohemotransfusion involves harvesting the patient 's own blood for surgery. This method has several advantages: 1) excluded the risk of infection and immunization , and 2) cost-effectiveness , and 3) the best clinical effect and usefulness of red cell survival . Harvesting is done by blood sampling to its simultaneous operation of 400 ml (1 dose). Autotransfusion blood gas transporter or plasma are carried out in the following situations:

a) complex and large planned surgical procedures foreseen with blood loss greater than 20% of blood volume (orthopedics , cardiac surgery , urology) ;

b) pregnant women in the third trimester when indicated for elective cesarean section autodonorskoy the possibility of holding the blank plasma volume up to 500 ml ;

c) a rare blood type and the patient's inability to selecting an adequate amount of donor blood components ;

d) failure of patients from transfusion of allogeneic blood products for religious motives with testimony to the transfusion of blood components during routine surgery.

Carrying autologous transfusions carried out by different methods: 1) 3-4 weeks for scheduled surgery harvested 3-4 doses (up to 1000-1200 ml of autologous blood canned or 600-700 ml autoeritrotsitnoy mass) , and 2) directly to the surgery or anesthesia they prepare top 1 -2 units of blood (600-800 ml) with mandatory completion of a temporary loss of blood plasma substitutes and salt solutions with support normovolemia or fluid overload . Each of these methods can be used separately or in various associations. The possible simultaneous or sequential application of autologous transfusion with allogeneic blood components .

Autodonorstvo increases the safety of transfusions for a particular patient and used to reduce the risk of post-transfusion complications. The patient must give written consent for the harvesting autologous blood or its components , which is recorded in history.

Testing autologous and components similar to that of allogeneic blood components. Autodonorom can be any person age limit determined physical development and physical condition of the child and the severity of peripheral veins. Typically, autotransfusion blood components are used in individuals 5 to 70 years.

The volume of single donations for those weighing more than 50 kg should not exceed 450 ml . When the body weight less than 50 kg volume donations - not more than 8 ml per kilogram of body weight. Individuals with body weight less than 10 kg in the therapeutic autodonorstvu not allowed. The hemoglobin level in each autodonora before donations must not be lower than for 110 g / l hematocrit - not below 33%.

The frequency of autologous blood donations determined by a doctor who treats and Transfusion . It should be borne in mind that the volume of plasma and serum total protein and albumin restored within 72 hours , that is the last donations before elective surgery should be made up to 3 days .

We must not forget that each one dose of blood sampling reduces the iron stores of 200 mg (approximately 1 mg per 1 ml of red blood cells), so the first donations to start taking iron supplements .

Storage of autologous blood or its components is carried out for the same rules as for homologous blood components.

Not allowed to autodonorstvu persons with established foci of infection or bacteremia in the verification of unstable angina , aortic stenosis , sickle cell anemia , thrombocytopenia (platelet count less than 180×10^9 per liter), and the positive results of serological testing for HIV, hepatitis and syphilis.

Regional perfusion is used to create artificial circulation in an isolated part of the body (limbs) or organs (lungs, liver, dive) . The method makes it possible to create high levels of medical drugs (anticoagulants, anti- inflammatory drugs) in a particular place , isolated from the general circulation , as in normal use images remedies can cause a toxic effect on the whole body.

In vitro (artificial) blood flow by a special heart-lung machine . In this case, the heart and lungs are completely cut off from the circulation with a temporary replacement of the device, which allows you to perform operations with congenital and acquired , as well as the large vessels on the open heart . In this heart-lung machine is to provide support to the three interrelated systems - circulatory , respiratory and blood system to a level that meets the needs of the organism. Under the adequacy of cardiopulmonary bypass means a condition that meets the needs of every cell in the body of oxygen.

Hemodialysis "artificial dive " is used in patients with chronic or acute renal failure. The essence of the method - the removal of the patient's blood of excess nitrogenous waste products and electrolytes , output toxic substances , the elimination of excess water during hydration , restoration of electrolyte composition of the blood .

Exchange transfusion - the partial or complete removal of blood from the blood of the recipient with the simultaneous replacement of its adequate or greater than the volume of blood . The purpose of the method - removal with the blood of toxic substances (with

endogenous intoxication), degradation products of hemolysis (hemolytic disease of the newborn). Exchange transfusion is carried out at a newborn blood incompatibility of mother and child on the Rh factor or group antigens.

- RH- conflict occurs when the Rh- negative woman the fetus has Rh- positive blood

• ABO conflict occurs if the mother $0\alpha\beta$ (I) blood group, and the child beta (II) or $V\alpha$ (III) group.

Absolute indications for exchange transfusion in the early days of life in term infants:

- The level of indirect bilirubin in the umbilical cord blood of more than 60 $\mu\text{mol} / \text{L}$;
- Indirect bilirubin level in peripheral blood is more than 340 $\mu\text{mol} / \text{l}$;
- Hourly increase of indirect bilirubin (4-6 hours) over 6 $\mu\text{mol} / \text{l}$;
- Hemoglobin is less than 100 g / l .

Technique of exchange transfusion in neonates.

Total blood volume is 2-3 circulating blood volume (blood volume in the newborn of 80 ml / kg). Distribution: 2/3 of the volume of packed red blood cells (ermasa), third volume - fresh frozen plasma (FFP). When Rh is used single-group conflict FFP and single-group Rh- negative ermasa. When conflict ABO applied Rh- CO ermasa $0\alpha\beta$ (I) of plasma and AB (IV) group. The procedure is done through the navel catheter, while respecting the rules of asepsis. Donated blood is warmed to 37 °C. Interleaving operation is performed by introducing and removing 15-20 ml of blood in term (10 ml preterm) with an average rate of 2-3 $\text{ml} / \text{kg} / \text{min}$. The total operation time of 90-120 minutes. After each 100 ml replacement slowly injected intravenously 2 ml of 10% solution of calcium gluconate.

Indirect blood transfusion is the most common method in connection with the performance and ease of accessibility. Methods of administering blood: intravenous, intra-arterial, intramedullary, intra-, intracardiac, drip, spray. Intravenous is the most common way to do this, use the forearm vein, back of the hand, leg, foot. Venipuncture performed after treatment of the skin with alcohol, higher puncture foreseen impose harness so that it squeezed only superficial veins and arterial system remained free. Do puncture the skin on the side or on top of the vein by 1-1.5 cm below the foreseen puncture veins, pushing the needle tip under the skin of the wall of the vein and the vein wall puncture is performed with the introduction of the needle in its lumen. If the required continuous transfusion for several days, then use the subclavian vein.

Tech Lab v. subclavia for Seldinger technique

The patient - lying on his back, under his head and chest enclose roller head turned to the side opposite the puncture site. After treatment, the surgical field and the surgeon's hands (70% alcohol, 5% sodium yodonata) carried skin puncture the lower edge clavicle 0.5 cm from its edge to the inner edge and the middle third. The needle is advanced parallel to the clavicle and the end of the needle is directed at several collarbone up to the middle line, so as to form an angle with the chest wall

30-35 °. After the needle by 0.5-0.8 cm its further progress is accompanied by pulling a small piston, creating a vacuum. After contact with the needle into the vein (at

a depth of 1-3 cm) blood stream flows into the syringe. In this case, disconnect the syringe from the needle , closing her fingers clearance (prevention of air embolism) , the needle is introduced into the lumen of the conductor to a depth of 8-10 cm, the needle is removed . By the rotational movement of the conductor catheter . After introducing the catheter to a length equal to the distance from the place of its entry to the sternum removed conductor . Until the end of the catheter is attached to the system transfusion. The catheter is fixed to the skin of plaster and aseptic dressing.

If the superficial veins are expressed poorly , transfusion can be carried out by venesection .

Technique of the venesection

Venesection to use any part of the body . Treated with the surgical field (70 % alcohol , 5% iodine solution) and draped with sterile white space foreseen cut impose 0.5 % procaine . Skin incision of 3-4 cm is carried along the vein , the vein was isolated by blunt of the subcutaneous tissue , and it is fed by two ligatures : the first - to hold the needle Dufour stmassovogo or plastic catheter , the second – for ligation of the distal end of the vein (it serves as a landlord) . Summarizing the vein of ligature scissors sharpened reveal its lumen , in which a catheter is introduced and followed by fixation ligature . Applied to the skin 2-3 silk suture . After transfusion of the catheter was washed with saline with heparin (1 ml of heparin per 100 ml saline) and the following transfusion closed flap.

And Intra- Arterial blood transfusion is reserved manner. It can be applied , for example, when a sudden massive bleeding during thoracic surgery when pumping blood Intra particularly effective and easy to implement. Intra-arterial blood transfusion and intra- making is carried out in different ways at high pressure bottle. Most often used for this purpose rubber bulb with pressure gauge, connecting them to the airway needle drip system . When the terminal states and clinical death is recommended to transfusion under pressure of 160-200 mm Hg The main difference between intra-arterial transfusion of intravenous have expressed reflex stimulation of cardiac activity in the stimulation angioretseptorov and restoration of coronary blood flow. Intra-arterial blood transfusion shown in cardiac arrest , if clinical death is caused by a massive irreparable loss of blood , with terminal conditions , especially if they are associated with prolonged hypotension (60 mm Hg or less) as a result of blood loss , shock trauma , intoxication , etc. § At present, these methods are not widely used due to the improvement of methods of resuscitation.

Intraportal blood transfusion possible . To do this, select and vessel catheterization of the portal system . In practice, this is rarely the image .

Intraosseous blood transfusion is not a widespread way , the reason for this - the simplicity and accessibility of transfusions in the subcutaneous veins . At the same time, the intraosseous transfusion characterized by simplicity, availability, relative ease of implementation , even in difficult situations. To perform intraosseous infusion using valikocharunkovym spongy bone structure , which have a relatively thin cortical bone , good venous drainage and located far away from vital organs: the calcaneus , distal lateral process of epiphysis and the greater trochanter of the femur , iliac crest bone - rarely other cancellous bone of the skeleton. Technology Implementation : After soft-tissue anesthesia with 0.5% solution of novocaine , perform a needle puncture of the bone Kasirskogo with

safety clutch mounted on 1-1.5 cm for adults and 0.4-0.6 cm for the children, then enter 2-4 ml 2% novocaine , after which the transfusion. Rate at which the fluid gravity is 5-20 drops per minute, which is very slow, so high - pressure zdayut with a rubber balloon and a transfusion is performed at a rate of 60 drops per minute. The advantage of the method is that a strong fixation of the needle into the bone can continuously enter the required amount of liquid without fear phlebitis , thrombosis and embolism .

TECHNOLOGY BLOOD TRANSFUSION

Preparation of the system and the start of transfusion . Transfusion need to use disposable plastic system with capron filter that helps prevent blood clots from entering the bloodstream patient. The system is composed of a short tube with a needle and a filter for air in a bottle , a long tube for infusion of blood with two needles at the ends - for injection in a vial and the patient's vein puncture . The system is provided with a dropper capron filter and clamp plate to control the rate of administration. Produced in a sterile plastic bag from which it is removed prior to use.

Reusable system for blood transfusion should not be used because they do not have a microfilter .

By building a system for a blood transfusion , you must follow regulations - transfuse blood from the same vessel from which it was harvested and stored .

Monitoring of blood transfusion. Transfusion rate controlled by a special clamp which squeezes the rubber or plastic tube system. Blood should be administered dropwise at a rate of 50-60 drops per minute . During the period of transfusion should be monitored for the sick , to the first signs of transfusion reaction or complication to stop and start the infusion of therapeutic measures . In the case of thrombosis needles should not try to clean it ! Necessary to block clamp system for infusion, disconnect it from the vein , remove the needle from the vein and the puncture site bandage , then another needle to puncture a vein and continue another transfusion .

During a blood transfusion is permissible to mix with sterile , hermetically packaged solutions substitutes in standard packages. When the vial , ampoule , a plastic bag 20 is close ml of blood transfusion is stopped. Vein with a needle and pull on the puncture site aseptic bandage is applied . The blood that was left in the bottle without breaking aseptic technique , placed in the refrigerator , where it is stored at a temperature of +4 ° C for 48 h . When you see a patient reactions or complications that blood can be used to find out the reasons for their occurrence.

Registration blood transfusion . After completion of the transfusion of blood in the medical history and a special journal to record the blood transfusion record specifying the dose of transfused blood, its passport data , the results of compatibility tests for the presence or absence of reactions or complications.

Monitoring of patients after blood transfusion . After the transfusion of blood or blood components to the patient required bed rest for 3 - 4h . Watching him during the day the doctor and nurses .

Indications for blood transfusion

Although acute blood loss at a time can lead to substantial disruption of life, medical intervention is not always necessary. The definition of acute massive blood loss that requires a transfusion intervention , due to the large number of reservations required , as

these reservations, these partiality give the doctor the right to hold or not to hold a very dangerous operation of transfusion of blood components. Acute blood loss should be regarded as a massive, such that the transfusion needs help, if for 1-2h tentatively estimated blood loss was not less than 30 % of its initial volume.

Blood transfusion - a major intervention for the patient, and the indications for it to be valid. If possible, provide effective treatment for the patient without blood or there is no certainty that it will benefit the patient, blood transfusions should be abandoned. Indications for blood transfusion defined purpose which it pursues, - reimbursement of the missing volume of blood or its components or increased activity of the blood coagulation system with bleeding.

Absolute indications for transfusion are considered

- acute blood loss,
- shock,
- bleeding,
- severe anemia,
- severe traumatic surgery,
- particularly with extracorporeal circulation.

The indications for transfusion of blood and blood components are of different origin anemia, a blood disease, purulent-inflammatory diseases, severe intoxication.

If absolute, life-saving blood transfusion (shock, severe blood loss, severe anemia, bleeding that lasts a long time, severe traumatic surgery) have a blood transfusion, despite the presence of contraindications. It is expedient to choose specific components of blood and its preparations, carry with preventive measures. In allergic diseases, asthma, when blood transfusion is carried out for the urgent indication for the prevention of complications introduced in advance of special funds (calcium chloride, antihistamines, corticosteroids), and from blood components used by those who own the least antigenic action, for example thawed and washed red blood cells. It is advisable to mix the blood with blood substitutes directed action, and during surgery autokrov use.

Contraindications to blood transfusion

Contraindications for blood transfusion include:

- 1) cardiac decompensation in heart diseases, myocarditis, myocardiosclerosis;
- 2) bacterial endocarditis;
- 3) hypertension third stage;
- 4) cerebral blood flow;
- 5) thromboembolic disease;
- 6) pulmonary edema;
- 7) acute glomerulonephritis;
- 8) severe hepatic impairment;
- 9) the general amyloidosis;
- 10) allergic condition;
- 11) asthma.

Structural and logic threads

The algorithm of the order of a blood transfusion.

Blood transfusion practitioner should carry:

1) Identification of blood group and Rh factor and blood of the donor patient , despite the stamps in my passport and medical history of the patient and to the label of donated blood.

2) Test for compatibility group : in a Petri dish coated 2-3 drops patient serum (of the recipient) was added a small drop of blood donor are mixed and the result observed for 5 min. Erythrocyte agglutination should not be. If agglutination appeared , this blood - compatible.

3) Poliglyucin method - in test tube 2 dropwise patient serum , 1 drop of blood of the donor and one drop of a 33% solution poliklyukinu . Stirring , the tube was rotated so that its contents are flowed along the walls . After 5min . the tube is filled 3-4 ml saline . Agglutination should not appear.

4) Test for Rh compatibility.

5) The biological sample . Performed at the bedside . Hooking up the system is administered bolus of 10-15 ml of blood , and then for 5 minutes. observe the state of the patient. In the absence of a sign of reaction procedure is carried out 2 more times. Lack of response after triple checking the ground for drip infusion dose of blood that remained .

6. Materials for self-control.

1. Methods and techniques of blood transfusion
2. Causes of complications (Group)
- 3 . liquid plasma expanders
- 4 . The principles of transfusion therapy in various states of the organism
- 5 . Harvesting and preservation of blood and blood components

6.1. Tascs for self-control .

questions :

- The indications and contraindications for the PC ;
- Methods and storage time stored blood , its components ;
- The route of administration of blood ;
- Equipment for the PC ;
- The method of drip and jet PC ;

be able to:

- To determine the blood group ;
- Macro- spending life blood for transfusion ;
- Mount system for your PC, fill it out ;
- To determine the projection of the main veins on the skin, to be able to puncture them ;
- Provide individual sample and the sample on the Rh- compatibility, a biological sample ;
- Transfuse blood bolus and infusion ;
- Provide first aid for a vocational school ;
- Fill in the "Protocol PC ."

objectives:

1. To do transfusion and monitoring of patients during its execution .
2. Classified of method of blood transfusions .
3. To do test for compatibility for ABO and Rh system
4. To do biological test
5. Filling documentation during blood transfusion

6.2 . Situational problems .

1. The doctor found that the patient within 12 hours lost 400 ml of blood. Having determined the blood group to the patient and the vial of blood , Rh- , and, after trial on the individual and Rh compatibility, poured 400 ml of blood. After 5 min. after a blood transfusion in the patient developed chest pain and back pain, shortness of breath , cold sweat , and tachycardia. As with the patient and the doctor 's mistake ?

A: The early post-transfusion reaction . Do not carry out biological sample . The loss of 400 ml of blood are not evidence for a transfusion .

2 . In the emergency room surgical hospital delivered injured in a traffic accident in an unconscious state with marked pallor , blood pressure is not detected , the pulse thready , ill considered . Blood loss by Phillips 2.5 liters. Another doctor determined the blood group , blood is sent to a laboratory to determine the Rh factor and waited for an answer. After 25 min. the patient died . Is the doctor did ? What should be the tactical ka ?

Answer: False . To obtain a response from the lab to begin urgently needed to transfuse blood products hemodynamic effect , Rh- negative red cell mass.

3 . In the acceptance department delivered surgical hospital patients with extensive multiple wounds in a state of shock. The patient pale , cold sweat, confused mind , thready pulse, blood pressure 80/50 mm Hg What transfusion therapy you assign to the patient ?

Tests in the volume " Step1 " and " Step2 " .

Test number 1. Blood samples for determination of compatibility system ABO and Rh factor is carried out :

- A) of the finger on the slide ;
- B) veins in the blend ;
- In) of the finger on the slide with the addition of sodium citrate ;
- D) veins in a dry test tube ;
- D) veins in a test tube with isotonic sodium chloride solution;

Test number 2 . Transfusion of blood :

- A) is checked before the first transfusion ;
- B) is checked before each transfusion ;
- B) does not check the data in the passport ;
- D) is not checked , it is enough data in the medical record ;
- D) does not check the data history ;

Test number three . Blood transfusion in patients who are in a state of anesthesia

:

- A) test for compatibility conducted in full;
- B) does not meet the biological sample ;
- B) is carried out only biological sample ;
- R) is determined only by the compatibility ABO system ;
- D) is determined only by the compatibility of Rh ;

Test number 4 . Transfusion and obstetric history before blood transfusions can:

- A) to prevent potential transfusion complication ;
- B) rushed to pick up donated blood ;
- B) determine the Rh blood group affiliation and patient;
- T) vyavitsnasledstvennyye disease;
- D) to make medical history ;

Test number 5 . In preparing patients for blood transfusion is necessary:

- A) make a general analysis of urine;
- B) do a complete blood count ;
- B) collect blood transfusion history ;
- D) collect obstetric history ;
- D) do all of the above ;

Test number 6. Specify the allowable methods of blood transfusion :

- A), intravenous, intraarterial , intraosseous ;
- B) subcutaneous, intraarterial , intraosseous ;
- B) intravenous, epidural , enteral ;
- D) intravenous, subcutaneous, endolymphatic ;
- D) intra-arterial , intraosseous , endotracheal ;

Test number 7. How to proceed with the bottle , which was released after the transfusion of blood and its components of :

- A) it washed and hand over to the lab ;
- B) throw ;
- B) 10-15 ml of blood was left in the vial and stored for two days ;
- D) 10-15 ml of blood is left in the vial and stored 30 days;
- D) leave 10-15 ml of blood in a vial and stored until patient discharge ;

6.3 Tests for self-control (basic knowledge)

1. In patient M. , 37 years old with abdominal trauma and intra-abdominal bleeding , damage to the hollow bodies have been identified. In auditing the abdomen revealed no 2L blood clots . How to compensate for BCC ?

- A) reinfusion of blood from the abdominal cavity B) single-group transfusion of stored blood ;
- C) svezhetsitratnoy blood transfusion ; D) transfusion of donated blood ;
- E) via blood .

2 . In the patient K. , 35 years old, in thrombocytopenia occurred gastric bleeding . What is the component of blood transfusion to the patient appropriate ?

- A) red blood cell mass , and c) platelet mass , C) albumin ; D) native plasma ;
E) A dry plasma.

3 . During a blood transfusion during a biological sample in a patient came chills, sore covered with cold sweat , said flashing before his eyes, a slight pain in the lumbar area . What state has evolved into a patient?

- A) transfusion reaction , B) pyrogenic reaction , C) bacterial and toxic shock ; D) citrate shock, E) attack of renal colic.

4 . The patient, 27 years old , delivered with a knife wound abdomen 4 hours after injury. A serious condition . Pulse - 120/min . , Weak , BP - 70/40 mm Hg laparotomy was performed . In many liquid abdominal blood. Assigned bleeding vessels folds small intestine. The bleeding stopped. Damage hollow bodies have been identified. How best to restore blood loss ?

- A) pour red cell mass , and c) to autologous blood reinfusion , C) pour the washed red blood cells ; D) pour fresh frozen plasma , and E) pour reopoi glyukin .

5 . The patient , 40 years old, with blood group A (II) was performed for the indication of native plasma transfusion of blood group A (P). 20 minutes after the transfusion the patient noted a strong fever, fever up to 40 ° C, headache and pain in muscles, bones , shortness of breath. On examination - cyanosis of the lips . Pulse - 106/min . BP - 103 /90 Which type of transfusion complications is this state ?

- A) pyrogenic reaction , B) an allergic reaction , C) transfusion shock ; D) transfusion reaction , and E) гемотрансфузионноеосложнение .

6. The patient , aged 50, as a result of erroneous transfusion of incompatible blood transfusion suffered a shock II severity, after which the output of a patient after 1.5 weeks developed uremia . What period blood transfusion shock meets this condition ?

- A) acute intestinal failure; B) own blood transfusion shock , C) oliguria and anuria ;
D) restoration of urine output , and E) recovery.

7. In order to quickly replenish the patient transfused blood loss of 1050 mL of serologically - compatible donor blood preserved with sodium citrate . At the end of gemoranefuzii in patient anxiety arose , pale skin , anxiety , tachycardia, blood pressure dropped to 60/40 mm . Hg, there were muscle cramps . What complication occurred in a patient ?

- A) transfusion shock, B) pulmonary embolism , C) citrate shock ; D) anaphylactic shock, E) pyrogenic reaction .

8. The patient, 48 years old , enrolled in 5 hours after injury with fracture of two ribs on the left , left-hand gemopnevmotoraksom . Against the background of infusion therapy , 4 minutes after the start of transfusion of plasma single-group became restless , felt a sharp stuffiness . Systolic blood pressure decreased from 90 to 60 mm Hg diastolic is not defined on the skin urticaria phenomenon . What is a complication ?

- A) anaphylactic shock, B) traumatic shock , and C) transfusion shock ; D) plevropulmonalny shock, E) pulmonary embolism .

9. The patient, 40 years old , delivered to the hospital emergency room with symptoms of gastro -intestinal bleeding, severe anemia with a deficit of BCC - more than

30%. The patient need a blood transfusion . What sequence of actions of the doctor , who must pour the blood?

A) Identify the blood group and Rh factor of the patient and conduct tests on the compatibility of the recipient's blood , B) Determine the Rh- host by antirhesus sera , C) Determine the suitability of the transfusion of blood and its group membership ; D) Identify the individual and rhesus compatibility of the donor and the patient's blood , and E) Conduct a biological sample .

Tests and testing task source of knowledge .

1. For whole blood characteristic is:

- a) the protein content in the serum concentration in a conventional
- b) increased the content of coagulation factors
- c) increase in the number of leucocytes and thrombocytes
- d) reduced content of potassium
- e) reduced content of sodium

2 . So -called universal donor blood is considered :

- a) any blood group 0 (I)
- b) the blood 0 (I) Rh (-) with a titer of 1:64 agglutinin
- c) the blood 0 (I) Rh (-) with a titer of 1:64 over agglutinin
- d) g) blood 0 (I) Rh (-)
- e) d) blood 0 (I) Rh (+)

3 . What is not a complication of massive blood transfusion :

- a) hypercalcemia
- b) hemolysis
- c) hyperkalemia
- d) acidosis
- e) alkalosis

4 . What are the responsibilities of donors :

- a. Comply with the interval between the delivery of blood
- b. report the skin and venereal diseases
- c. accept the surrender of the full dose
- d. to require the satisfaction of benefits for donors
- e. comply with a healthy lifestyle

5 . Why should observe the principle of harvesting and the use of blood , " one donor - one patient ":

- a) reduces the possibility of the disease due to the development of infection in the bottle
- b) reduces the possibility of transmission of viral and infectious diseases from the donor
- c) to reduce the possibility of sensitization of the recipient by foreign agents
- d) reduces the possibility of complications and reactions
- d) do not conduct a test on individual compatibility

6. What amount of antigen in human erythrocytes ?
- a) 3
 - b) 5
 - c) 30
 - g) 106
 - d) 250
7. At that indicates detection of serum antibodies to Rh system ?
- a) the patient received a blood transfusion of Rh - positive
 - b) the patient is not given antigen , the patient is Rh negative
 - c) increased patient reactivity
 - d) the woman had to Rh factor in pregnancy
 - d) the patient can be transfused only Rh- negative blood
8. How many individual tests for compatibility required when blood transfusion ?
- a) one
 - b) three
 - c) Two
 - d) five
 - d) six
9. How important is the distribution on the Rh -negative and Rh- positive people ?
- a) The same person may be Rh- positive and Rh - negative
 - b) Rh-negative person is , if it has no D antigen , but there are C, E and other
 - c) A antigen most active and frequent
 - d) person is Rh- negative if it does not have antigens A , C, E
 - e) pour Rh- negative recipient can only Rh- negative blood donors
- 10 . Shelf life eritrotsitarnoi mass at t o 4 Co on preservative glyugitsir :
- a) 21 days
 - b) 7 days
 - c) 14 days
 - d) 25 days
 - d) 30 days
11. The shelf life of frozen red blood cells, which are suitable for transfusion :
- a) 5-10 days
 - b) 1 year
 - c) 1 month
 - g) 3 years
 - d) 5 years
12. What is the maximum period of storage of washed red blood cells :

- a) 24 h
- b) 72 h
- c) 2 days
- g) 6 hours
- d) 4 days

13. What are the reasons for the limited indications for the use of direct blood transfusion ?

- a) blood is examined for hepatitis B and AIDS
- b) blood does not provide for the use of filters during transfusion
- c) the difficulty of the previous survey of donors
- g) lack of advantages in comparison with the transfusion of fresh cooked "warm" blood
- d) the technical difficulties of applying

14. At that , first of all , you need to pay attention to when the macroscopic evaluation of the quality of preserved blood ?

- a) bacterial contamination , the presence of clots , hemolysis
- b) blood chylous
- c) compliance certification
- d) sealing packaging
- d) compliance with conservation

15. What amount of blood, packed red blood cells or plasma are administered when the biological sample ?

- a) 10-15 ml 3 times
- b) 20-25 ml 3 times
- c) 2-5 ml 4 times
- d) 30-40 ml of 1
- d) 10-15 ml, 2 times

16. What are the initial clinical symptoms of complications associated with transfusion of incompatible blood for the ABO system ?

- a) drop in blood pressure , the appearance of red urine
- b) fever or burning sensation
- a) abdominal pain, muscle head
- d) the acceleration of heart rate , breathing , paleness
- e) anuria
- e) hemorrhagic syndrome

17. What is the main advantage of the transfusion of washed red blood cells ?

- a) they are areactogeno stransfusion medium lacking because leukocyte antigens and proteins
- b) does not cause reactions in patients who have been sensitized to the antigens of the HLA system
- c) have no toxic effects and metabolic products citrate cellular components

- d) have a lower risk of contracting hepatitis and cytomegalovirus
- e) transfusion Wednesday rheological actions

18. What blood transfusion safety?

- a) autologous blood transfusion
- b) reinfusion of blood
- c) thawed washed red blood cells
- g) packed red blood cells
- e) Whole Blood

19. Basic prevention of hepatitis B infection and retroviruses in transfusion :

- a) transfused red cell mass and blood products when they are badly needed
- b) draw blood relatives
- c) use autokrov
- g) Use the reinfusion
- e) The mandatory testing of blood donations
- e) Use a disposable system

20. What is the old blood, which resulted in a body cavity can be used for reinfusion

?

- a) up to 12 hours
- b) up to 24 h
- c) up to 48 hours
- d) up to 72 hours
- d) up to 2 hours

21. Select salt for the prevention and treatment of citrate intoxication.

- a) Nacl
- b) Cacl₂ or calcium gluconate
- a) Kcl
- g) Mgcl₂
- d) Fecl₂

22. The optimal way of blood transfusion :

- a) intravenous
- b) the intra-
- a) Intra-
- g) in the cancellous bone
- e) exchange transfusion

Case studies for the source of knowledge

1. In the surgical department to urgently delivered a patient with gastroduodenal ulcer hemorrhage etiology that lasts a long time . Displaying a blood transfusion to this patient ? For what purpose ? To what extent ?

2 . During the month, in a surgical hospital treated a patient with deep burns of 15 % and is preparing for cutaneous dermatomal autoplasty . Clinically, it is set hypoproteinemia , anemia, mild , sometimes "unhealthy " granulation burn surface . Is there evidence of a blood transfusion in this patient? For what purpose ? To what extent ? The predominant route of administration.

3 . If you recorded a blood transfusion pyrogenic reactions of moderate severity. Which, in your opinion, may be the cause of her ? Your treatment and prevention measures?

4 . 2 hours after intravenous transfusion 250.0 mL of blood in the single-group patients had post-transfusion shock you to the transfusion of Rh- incompatible blood . Your arguments and curative measures .

5 . As a result of the massive intravenous transfusion to the patient 68 years old, who admitted to the hospital with profuse bleeding ulcers , came a sharp expansion of the heart . Ba -shi tactical and therapeutic measures .

6. The patient was transfused intravenously 250.0 mL single-group levels. The next day, he noted yellowness of the skin, sclera icterus , urine -saturated red. Determining the causes of post-transfusion complications found : measurement of body temperature after transfusion, the patient was not spent , the first portion of urine , and the next morning urine

Day of macro- and microscopically was not investigated ; bottle from which flowed the blood of pain - Nome , has been washed immediately after transfusion.

What are the errors in the monitoring of patients after blood transfusion and re - organization of blood transfusion ? Measures to prevent them.

7. As a result of improper filling system for blood transfusions in the venous bed patient got a few air bubbles. What complications can develop ? The clinical picture and prevention.

Tests III level of complexity

1. Which recipients are categorized as hazardous because of the possibility of hemo-transfusion complications :

- A) those who have had a blood transfusion ;
- B) those who have had an infectious disease ;
- B) those suffering malignant diseases;
- D) those suffering blood diseases ;
- D) there is no such category ;

2 . Test for individual compatibility of blood made between :

- A) plasma or serum of the patient and the blood of the donor;
- B) and blood plasma donor patient;
- B) formed elements of the patient's blood and the blood of the donor;
- D) formed elements of the blood donor and the blood of the patient;
- D) a complete blood donor and holistic patient's blood ;

3 . Indications for blood transfusion is determined by:

- A) an allergic condition of the patient ;
- B) as a shock ;
- B) the presence of hepatic and renal failure;
- D) the need to fill the loss of blood ;
- D) the presence of the patient beriberi ;

4 . Which of the following pathological conditions can receive blood that is suitable for reinfusion :

- A) an ectopic pregnancy ;
- B) enterorrhesis ;
- B) splenic rupture ;
- D) rupture of an aortic aneurysm ;
- D) rupture of the gallbladder ;

5. Pokazaniyami for intra-arterial blood transfusion are:

- A) severe shock ;
- B) predagonalnoe condition resulting from acute blood loss ;
- B) clinical death ;
- D) preoperative ;
- D) surgery ;

6. Intraosseous blood transfusion is carried out :

- A) club crest bone;
- B) of the femoral shaft ; B) the calcaneus ;
- D) sternum ;
- D) metaphysis of the tibia ;

Select the right combination of :

- A) 1,2,3 B) 2,3,4 , B) 1,3,4 , D) 1,3,5 , D) 1,2,5 .

7. The optimum storage temperature of stored blood :

- A) from 0 to 200C ;
- B) from 4 to 600C ;
- B) from 8 to 1000C ;
- D) -100C ;
- D) 200C ;

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8. The distribution points are awarded to students:

At mastering topic number 8 to content module 2 for training activities for students rated a 4-point scale (traditional) scale, which is then converted into points as follows:

rating	Points
5 (excellent)	5
4 (good)	4
3 (satisfactory)	3
2 (poor)	0

Guidelines prepared

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