

On approval of Requirements for medical examination of donors, safety and quality in the production of blood products for medical use

Invalidated Unofficial translation

Order of the Minister of Healthcare of the Republic of Kazakhstan dated April 15, 2019 № KR MHC-34. Registered in the Ministry of Justice of the Republic of Kazakhstan on April 16 2019 № 18524

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Unofficial translation

Footnote. Abolished by order of the Minister of Health of the Republic of Kazakhstan dated 02.10.2020 No. ҚР DSM-113/2020 (shall be enforced upon expiry of ten calendar days after the day of its first official publication).

In accordance with paragraph 1 of Article 164 of the Code of the Republic of Kazakhstan dated September 18, 2009 "On Public Health and Health Care System", I **ORDER:**

1. To approve the Requirements for medical examination of donors, safety and quality in the production of blood products for medical use in accordance with Appendix 1 to this order.

2. To recognize some orders of the Ministry of Healthcare of the Republic of Kazakhstan as invalid in accordance with Appendix 2 to this order.

3. The Department of organization of medical assistance of the Ministry of Healthcare of the Republic of Kazakhstan in the manner established by the legislation of the Republic of Kazakhstan shall ensure:

1) state registration of this order in the Ministry of Justice of the Republic of Kazakhstan;

2) within ten calendar days from the date of state registration of this order in the Ministry of Justice of the Republic of Kazakhstan, sending its copy in paper and electronic form in the Kazakh and Russian languages to the Republican state enterprise on the right of economic management "Republican center for legal information" for official publication and inclusion to the Standard control bank of regulatory legal acts of the Republic of Kazakhstan;

3) placement of this order on the Internet resource of the Ministry of Healthcare of the Republic of Kazakhstan;

4) submission of information on implementation of measures provided by subparagraphs 1), 2) and 3) of this paragraph to the legal Department of the Ministry of Healthcare of the Republic of Kazakhstan within ten calendar days after the state registration of this order in Ministry of Justice of the Republic of Kazakhstan.

4. Control over execution of this order shall be assigned to the Vice-Minister of Healthcare of the Republic of Kazakhstan L. M. Aktayeva.

5. This order shall be enforced upon expiry of ten calendar days after its first official publication.

**Minister of Healthcare
of the Republic of Kazakhstan**

E. Birtanov

Appendix 1
to the order of the
Minister of Healthcare
of the Republic of Kazakhstan
dated April 15, 2019
№ KR MHC-34

Requirements for medical examination of blood donors and blood components and safety

and quality in the production of blood products for medical use

Chapter 1. General provisions

1. These Requirements for medical examination of blood donors and blood components and safety and quality in the production of blood products for medical use (hereinafter – the Requirements) are developed in accordance with paragraph 1 of Article 164 of the Code of the Republic of Kazakhstan dated September 18, 2009 "On Public Health and Health Care System" (hereinafter - the Code) and shall establish the requirements for medical examination of donors of blood and blood components and safety and quality in the production of blood products for medical use.

Chapter 2. Requirements for medical examination of blood donors and blood components

2. Withdrawal or admission to donation of a potential donor, determination of the type and volume of donation is carried out by the doctor of the blood service organization (hereinafter – the doctor).

Conclusion is made based on the assessment of results:

1) a confidential interview to identify risk factors, taking into account information from the questionnaire, supplemented, if necessary, by oral responses from the donor;

2) preliminary (for all categories of donors) and (if available) additional laboratory examination (for regular donors) in accordance with the requirements established by

the order of the acting Minister of Healthcare of the Republic of Kazakhstan dated November 10, 2009 № 680 "On Approval of the Rules for Medical Examination of a Donor before Donation of Blood and its Components" (registered in the Register of state registration of regulatory legal acts № 5934);

3) general state at the moment using methods of physical examination (measuring temperature, height and weight of the body, blood pressure, rhythm and pulse rate).

3. Upon suspicion or identification of factors of risk behavior of a potential donor that may cause the risk of transmission of a hemotransmissible disease, as well as if there are signs of other diseases, the scope of medical examination shall be expanded: examination of the skin and visible mucous membranes, auscultation, percussion, palpation, and additional laboratory tests or consultations of specialists shall be conducted.

4. When assessing the results of laboratory studies, the standards of laboratory studies indicators for blood donors and its components in accordance with Appendix 1 to these Requirements and the criteria for permanent and temporary withdrawal from donation of blood and its components in accordance with Appendices 2 and 3 to these Requirements are used.

5. If there are deviations from the standards of laboratory studies, the donor is removed from donation in accordance with the criteria for temporary suspension from donation of blood and its components in accordance with Appendix 3 to these Requirements.

6. If there are contraindications, the donor is notified of the reason for refusal of donation, and if necessary, it is recommended to undergo additional examination at the place of attachment in the primary health care organization.

7. The reason for withdrawal is registered in electronic databases of donors and persons not subject to blood donation, and in the donor's card.

8. If there are no contraindications to donation, the type and volume of blood donation and (or) its components are determined, and the following criteria are applied:

- 1) availability of applications from medical organizations for blood components;
- 2) voluntary informed consent of the donor to donate blood and its components;
- 3) minimum intervals between different types of donations of blood and its components, determined in accordance with Appendix 4 to these Requirements;
- 4) maximum allowable volumes of blood donation and(or) its components, which are:

for whole blood donors:

with a weight more than 50 kilograms (hereinafter-kg) and height of over 150 centimeters (hereinafter-cm) whole blood in volume of 450 milliliters (hereinafter- ml) \pm 10% shall be taken, as well as with additional removal of 30-35 ml of blood for laboratory studies and for storage as blood sample of the donor after donation;

with a weight less than 50 kg and height less than 150 cm it is possible the removal of a smaller volume of blood, in the calculation of 4-6 ml per kg of body weight, but not more than 13% of the total circulating blood volume (hereinafter - the VCB), which normally is a 6.5-7 % of body weight; as well as with additional removal of 30-35 ml of blood for laboratory studies;

for plasma donors:

with a weight more than 50 kg and height over 150 cm removal of plasma in a volume of 600-800 ml is conducted, but not more than 16% of VCB, as well as with additional withdrawal of 30-35 ml of blood for laboratory studies and for storage as blood sample of the donor after donation;

with a weight less than 50 kg and height less than 150 cm, plasma donation is not performed.

Chapter 3. Requirements for safety and quality in the production of blood products for medical use

Paragraph 1. Requirements for the premises, equipment and its maintenance, production organization, materials for production, input control of materials and equipment, production documentation

9. Sanitary and epidemiological requirements for the design, construction, water supply and sanitation, lighting, ventilation, air conditioning and heat supply, repair and maintenance of the premises of the blood service organizations are established in accordance with the sanitary rules approved by the order of the Minister of Healthcare of the Republic of Kazakhstan dated May 31, 2017 № 357 "On approval of the Sanitary rules "Sanitary and epidemiological requirements for healthcare facilities" (registered in the Register of state registration of regulatory legal acts № 15760) (hereinafter- the Sanitary rules).

10. Sanitary and epidemiological requirements for the maintenance of blood service facilities are established in accordance with paragraph 4 of Chapter 5 of the Sanitary rules.

11. Production premises are located in a logical sequence of the production cycle.

Premises, technologically connected by type of work are combined into functional blocks.

Location and size of the premises, placement of workplaces and equipment within the functional blocks are provided to ensure the appropriate direction of movement of donors, staff, and the flow of processes.

Premises to which the donors have access are separated from other work areas.

Closed areas are provided for questioning and inspection of donors.

12. Isolated rooms are allocated for the location of equipment that creates increased noise.

13. Premises for preparation of blood products and for laboratory studies shall be provided with authorized access.

14. Premises for preparing blood products are divided into the following categories according to the type of procedure:

1) clean rooms where the procurement and production of products is carried out within a functionally closed system;

2) especially clean rooms where the functionally closed system is disrupted during the processing process and aseptic conditions are required.

Zones of clean and especially clean rooms are separated from each other.

In clean and especially clean rooms, the air cleanliness is monitored in accordance with paragraph 172 of the Sanitary rules.

15. In working areas, conditions for hand washing are provided in accordance with paragraph 89 of the Sanitary rules.

16. Conditions are provided for separate storage of various categories of blood products in accordance with paragraph 90 of the Sanitary rules, as well as:

1) packaging and consumables;

2) technical inventory.

17. At all stages of production, storage and transportation of blood products, "cold chain" conditions are provided in accordance with paragraph 91 of the Sanitary rules.

18. Auxiliary zones located near production premises are equipped with appropriate equipment, detergents and disinfectants, and cleaning inventory:

1) rest rooms and catering facility (buffet);

2) rooms for changing clothes, washing and toilet;

3) separate rooms for equipment maintenance and storage of spare parts and tools;

4) separate rooms for storage of household and cleaning materials.

19. A person with a special professional technical education is responsible for monitoring the condition, maintenance and repair of equipment.

20. Production equipment is registered in the equipment register of the organization

The list of equipment which malfunction may have a negative impact on the quality and safety of products or on the speed of the production process is established and its regular maintenance is provided.

The amount of maintenance and its intervals are set separately for each type of equipment.

Plans and schedules for preventive maintenance and metrological control of equipment and measuring instruments are approved by the first head of the organization.

21. The following measurements are monitored:

1) temperature (of the donor's body; conditions of storage, transportation and use of blood and its components; incubation and exposure of samples during laboratory studies);

2) blood pressure (at the donor);

3) weight (of the donor 's body; blood or its components; the sample of the substance or reagents for conducting studies);

4) volume (of blood products, reagents);

5) time (separation of blood into components, their storage);

6) rotation speed (of the centrifuge rotor);

7) pH (of blood products, solutions, reagents, water);

8) optical density (of blood samples in a blood test for the presence of markers of hemotransfusion infections.

22. Cases of equipment breakdowns (failures) are registered and a report shall be drawn up (within the terms set by the manufacturer of each type of equipment), which is sent to the manufacturer or the organization, providing equipment maintenance. Faulty equipment is marked.

23. The personnel shall be trained in the rules of operation and maintenance of the equipment with application of documentary confirmation.

24. Instructions are developed that describe the actions of the personnel in the event of failures and malfunctions in the operation of each type of equipment.

25. Input control of materials and equipment purchased for production and verification of accompanying documentation is carried out.

The list of materials, positions and indicators subject to input control is established based on the requirements of regulatory documents for each specific material, taking into account the impact on the quality of the finished product and approved by the first head of the organization.

26. Before receiving the results of the input control, materials are placed separately from the tested products in the "quarantine" zone in compliance with the storage conditions established by the manufacturer.

If there is no accompanying documentation, the product shall be returned to the supplier or placed in temporary isolated storage until the necessary documentation is provided.

The obtained materials are subject to laboratory control in accordance with the regulatory document. Based on the obtained research results, a conclusion shall be issued on the suitability of the material.

27. The original and packaging materials that are considered suitable for use are marked with the words "approved for use" indicating the date of approval.

In case of non-compliance, a review on the quality of the material shall be issued, indicating the reason for non-compliance for presentation to the supplier (a reclamation act).

28. Original and packaging materials are released from the warehouse based on the following principles:

- 1) first received, first released;
- 2) parties are not mixed;
- 3) waste is disposed safely.

29. The quality and safety of blood products is ensured when:

- 1) examination of donors in accordance with these Requirements;
- 2) conducting laboratory studies (biochemical, immunohematological, testing for infectious markers) of donor blood samples in accordance with these Requirements;
- 3) procurement of blood and its components in accordance with the Rules determined in accordance with paragraph 5 of Article 162 of the Code;
- 4) use of modern methods of procurement of donor blood and production of its blood products registered on the territory of the Republic of Kazakhstan;
- 5) screening of donor blood for antileukocytic (HLA) antibodies with individual selection of components according to the HLA system;
- 6) compliance with the conditions of the "cold chain" for the safety of blood products at all stages of procurement, processing, storage and transportation and transportation of cryopreserved components separately from the cellular components of blood.

30. The traceability of the movement of each blood product from the donor to the receipt of the finished product and its delivery is ensured through paperless document management and electronic databases.

31. The maximum storage time is set for blood products obtained by methods with piercing of the hemakon:

- 1) for blood products stored at +2+60 C-24 (twenty-four) hours;
- 2) for blood products stored at room temperature-6 (six) hours;
- 3) for blood products stored in a frozen state, before freezing no more than 1 (one) hour after piercing, no more than 6 (six) hours after defrosting.

32. Original materials, as well as intermediate and final products, are provided with a label that indicates the features related to their status.

The label provides quick visual recognition of the product status (quarantined, released for use or intended for destruction, and so on).

33. The label of the finished blood product contains the following information:

- 1) identification number, unique for each unit of blood product (which determines the identity of the donor);
- 2) name of the blood product;
- 3) storage conditions;
- 4) expiration date;
- 5) the date of blood collection from which the blood product is made, or the date of production, if it makes sense;
- 6) ABO blood group and Rh-D blood type of the donor;
- 7) name of the manufacturer of the blood product.

34. Additional information for the consumers of blood and blood components on the product features, shall be set in accordance with the indicators of quality of donor blood and its components (hereinafter - quality Indicators) in accordance with Appendix 5 to these Requirements, but this information is not specified on the label and is provided in the form of a leaflet.

35. Issuance of blood products for sale is allowed after completion of all production control and quality control procedures, after establishing that their results meet the requirements.

The authorized personnel to authorize the issuance of ready-made blood products for sale shall be appointed by the order of the head of blood service organization.

After being issued from a blood service organization, blood products are not returned for reissue.

36. All procedures, premises and equipment that affect the quality and safety of blood products shall be subject to validation before they are put into effect.

Validations are repeated for any changes in the production process, including in the following cases:

- if there is a partial replacement of auxiliary materials or equipment;
- when implementing new processes, tools, systems, equipment, and tests;
- after moving, repairing, or configuring equipment items that could potentially affect the operation of the equipment, if there is any doubt about the proper functioning of the equipment.

37. A general validation plan is created that includes a list of procedures, premises, and equipment subject to validation, as well as a work schedule.

The validation procedure is documented, its plan and report on the results are compiled.

At each validation, the compliance of the final blood product with the quality Indicators is checked.

38. In the organization of the blood service, production documentation is maintained according to the approved forms of primary medical documentation of the blood service, approved by the order of the acting Minister of Healthcare of the

Republic of Kazakhstan dated November 23, 2010 № 907 "On approval of forms of primary medical documentation of healthcare organizations" (registered in the Register of state registration of regulatory legal acts № 56272).

Access to the documents containing confidential information is restricted.

39. Working instructions and (or) standard operating procedures (hereinafter - SOP) are developed for implementation of production procedures for attracting and selecting donors, procurement of blood and its blood components in hospital and on-site conditions, as well as upon production of products, production control of prepared blood and its components.

40. The SOP describes the sequence of operations, methods of its implementation, used equipment, materials, forms of primary medical documentation for recording data . The SOP determines the critical control points of procedures. The critical control point verification system is determined by planned tests and measurements and subsequent corrective actions, if it is determined that a specific critical point is not being monitored.

The control parameters of the critical control point verification system are documented. Corrective actions are taken when observations indicate that the situation may be out of control or is already out of control.

Paragraph 2. Requirements for production control of prepared blood and its components

41. Production control of components of donor blood consists in conducting laboratory studies of samples of donor blood (biochemical, immunohematological, screening of markers of hemo- transmissible infections) in a specialized laboratory(s) of blood service organizations.

The results of laboratory studies of donor blood samples are used in the selection of components of donor blood to determine their suitability for medical use.

42. Laboratory studies of donor blood samples are conducted:

1) biochemical test for the content of alanine aminotransferase (hereinafter - ALT) (if a preliminary testing of the donor's blood was not performed immediately before donation of blood and its components); to determine the amount of total protein in donors of plasma;

2) immunohematological-determination of blood group by the ABO system, Rh-affiliation, phenotype by the Rhesus system antigens, K-antigen of the Kell system, screening and identification of irregular anti-erythrocyte antibodies;

3) screening of markers of hemo-transmissible infections - human immunodeficiency virus type 1,2 (hereinafter-HIV- 1,2), viral hepatitis B (hereinafter - HBV), viral hepatitis C (hereinafter - HCV), syphilis, additional-for hematopoietic

stem cell donors (hereinafter-HSC) for infectious markers of cytomegalovirus infection , toxoplasmosis, T-lymphotropic virus of type I, II.

Paragraph 3. Requirements for biochemical testing of donor blood samples

43. The testing of ALT activity in a sample of donated blood taken during donation is carried out by one of the methods allowed for use on the territory of the Republic of Kazakhstan.

The results of the testing are evaluated in accordance with the instructions of the reagent manufacturer.

An increase in ALT above the norm is the basis for recognizing the received blood products as an absolute faulty and for withdrawal of the donor for 1 month, followed by a control examination.

44. Determination of the amount of total protein in donors of plasma is carried out in blood samples from each donation by one of the methods allowed for use on the territory of the Republic of Kazakhstan.

The results of the testing are evaluated in accordance with the instructions of the reagent manufacturer.

If there are deviations in the biochemical parameters, admission to subsequent donations is made in accordance with the criteria for temporary withdrawal from donation of blood and its components, established in Appendix 3 to these Requirements.

Paragraph 4. Requirements for immunohematological examination of donor blood samples

45. Immunohematological examination of donor blood samples is performed using the following methods:

column agglutination in automated and (or) semi- automated laboratory diagnostic systems;

in a liquid-phase system on a plane and (or) in test tubes with reagents with monoclonal antibodies.

Laboratory studies and interpretation of studies results are carried out in accordance with the instructions of the manufacturer of reagents and equipment.

46. In the absence of an automated information system, immunohematological examination of donated blood is performed in two stages:

1) the first - before blood donation, when in the presence of the donor, the blood group is determined by the ABO system by direct reaction, Rh-affiliation, presence of the Kell antigen;

2) the second – after donation, when a sample of donor blood from a test tube (vacuum) taken during blood donation is examined.

In the presence of an automated information system, immunohematological examination of the donor before donation is not carried out with the established blood group.

47. The blood group of the donor according to the ABO system is considered established and is not determined at the initial stage of testing before donation, if a 2-fold testing was conducted during different donations using automated technologies in the absence of discrepancies in the results of the testing.

The phenotype of the donor on the Rhesus system and its Rh-affiliation is considered established and is not determined at the initial stage of testing before donation, if a 2-fold testing was conducted during different donations using automated technologies in the absence of discrepancies in the results of the testing.

Presence or absence of the Kell antigen in the donor is considered established and is not determined at the initial stage of testing before donation, if a 2-fold testing was conducted during different donations using automated technologies and using anti-K reagents. If there is no discrepancy in the results of the testing, the testing of K antigen is not required for subsequent donations. When K antigen is detected, the donor is attracted to plasma or cell donations (except for red blood cells), and Kell - positive erythrocytes are disposed.

48. Selection of a sample of donated blood for immunohematological testing is carried out during donation in a disposable vacuum tube with a filler allowed in the instructions for reagents or in a vacuum tube with ethylene-diamine-tetraacetic acid (hereinafter - EDTA).

The label of the test tube contains the following information: surname and initials of the donor, date of birth, date of blood sample collection, and the donation bar code (if there is an automated information system).

Immune hematological testing of blood samples with signs of hemolysis, chilese are not conducted.

49. Storage of samples of donated blood is carried out at a temperature mode of +2 +80 C in accordance with the instructions of manufacturers of reagents, test tubes.

After conducting immunohematological studies, the test tubes are stored in the above conditions for at least 2 days.

50. A confirmatory testing of the group, Rh affiliation, is performed in blood samples from all donations.

51. When confirming the group affiliation testing using the ABO system, a double (cross) reaction is performed:

testing of the presence of group antigens on erythrocytes with reagents with IgM anti-A, IgM anti- B, IgM anti-AB antibodies;

testing of the presence of regular anti-erythrocyte antibodies in blood serum by standard erythrocytes of groups A and B.

The results of the testing are taken into account in accordance with the instructions of the reagents manufacturer.

The standard set of group markers for donated blood is considered to be:
in group O antigens A and B are absent, anti-A and anti - B antibodies are present;
in group A antigen A or A2 and anti-B antibodies are present;
in group B antigen B and anti-A antibodies are present;
in group AB antigens A and B are present, and anti-A and anti - B antibodies are absent.

If non-standard combinations of group markers are detected, the donor blood is rejected due to its biological characteristics.

52. The confirming testing of the donor's phenotype according to the Rh system and its Rh affiliation is performed in stages:

1) Rh affiliation is determined – the presence of antigen D is studied by an anti-D-super reagent containing complete antibodies (IgM class).

When the antigen D is detected on the studied red blood cells, the blood sample is recognized as Rh-positive, and the person whose blood was tested is recognized as a Rh-positive donor;

2) a blood sample which erythrocytes do not detect antigen D is further examined by an anti-D reagent containing incomplete antibodies (IgG class) in order to detect weak and variant forms of antigen D, while, in doubtful cases, the testing is performed using an indirect antiglobulin test (NAGT), as well as by anti - C and anti - E reagents to detect the presence of other antigens of system Rh - C and E on red blood cells.

A blood sample which erythrocytes do not detect antigen D, but antigens C and/or E are detected is recognized as Rh-positive, and the person whose blood was tested is recognized as a Rh- positive donor, but a Rh- negative recipient.

A blood sample which erythrocytes do not detect antigens D, C, E of the Rh system is recognized as Rh-negative, and the person whose blood was tested is recognized as a Rh- negative donor.

53. Screening of irregular alloimmune anti-erythrocyte antibodies (hereinafter-antibodies screening) in the serum of donor blood samples is performed regardless of the Rh – affiliation of the donor. Clinically significant anti-erythrocyte irregular antibodies are detected in the antiglobulin test.

Antibodies screening in blood samples collected from donors making irregular donations is performed at each donation.

Antibodies screening in blood samples collected from donors making regular donations is performed once a year, and if there is information about transfusions and (

or) pregnancy in the period up to 12 months after the last donation, it is performed out of turn.

To testing irregular alloimmune anti - erythrocyte antibodies, a panel of three samples of group O test-erythrocytes with the phenotypes ccDEE, CCDee, and ccdeeK is used. Freshly prepared or canned test erythrocytes are used.

54. Determination of the specificity of irregular alloimmune anti-erythrocyte antibodies is performed using a panel of test-red blood cells, including at least 10 samples, consisting of a combination of phenotypes that allows to determine the specificity of the main clinically significant antibodies: D, C, Cw, c, E, e, K, k, Fya, Fyb, Jka, Jkb, S, s, M, Lea, P14.

55. If irregular IgM IgG anti-erythrocyte antibodies or hemolysins are detected in a sample of donor blood, the donor's whole blood or plasma is not used for transfusion, while preparation of washed or defrosted erythrocytes is allowed.

If irregular IgM IgG anti-erythrocyte antibodies or hemolysins are detected, the donor blood is rejected due to its biological characteristics.

56. Determination of other blood group antigens is performed when forming a register of phenotyped donors, intended for selection of blood components for sensitized patients.

When forming a database of donor phenotypes, the Rh-Hr system antigens are additionally determined in blood samples: c(hr'), e(hr''), CW and other antigen systems : Lea, Fya, Jka, S.

Paragraph 5. Requirements for the testing of markers of hemotransmissible infections in donor blood samples

57. A laboratory testing for presence of markers of hemotransmissible infections (hereinafter- HTI): HIV-1,2, HBV, HCV, syphilis of donated blood samples at each donation of blood and its components.

The blood sample of the HSC donor is additionally examined for markers of cytomegalovirus infection, toxoplasmosis, T- lymphotropic virus of type I, II in the medical organization that sends the donor for donation.

The list of studied infectious markers is expanded according to epidemiological indications by the decision of local management bodies in the field of healthcare.

58. Selection of samples of donated blood for laboratory testing for infectious markers is carried out in disposable vacuum tubes during the donation of blood or components.

The tightness of test tubes with samples of donated blood is observed at all stages from blood collection to the moment of laboratory testing.

Storage of donor blood samples is performed in accordance with the instructions of the manufacturer of diagnostic reagents and vacuum tubes.

59. Test tubes with samples of donated blood are subjected to centrifugation. The centrifuge mode is selected in accordance with the instructions of the manufacturer of vacuum tubes. Repeated centrifugation of test tubes is carried out in accordance with the instructions of the reagent manufacturer.

60. Equipment and diagnostic reagents registered and approved for use in the Republic of Kazakhstan are used for laboratory testing of donor blood samples.

61. Laboratory testing of donor blood samples for infectious markers is performed using the following methods:

- 1) immunological testing of HTI markers;
- 2) molecular biological testing using nucleic acid amplification technology (NAT testing).

62. Immunological testing of donor blood samples is divided into screening (serological screening) and repeated testing, which are performed by immunoassay (IA) methods (chemiluminescent; enzyme immunoassay) and confirming testing, which is performed by the same methods, as well as immunoblotting (IB) and (or) hemagglutination reaction (RHA)/particle agglutination (RA) and other methods allowed for use on the territory of the Republic of Kazakhstan.

63. Laboratory testing of donor blood samples for markers of HIV-1,2, HBV, HCV, syphilis is carried out in two stages on automatic closed-type analyzers:

Stage I-serological screening for markers of HIV-1,2, HCV, HBV, syphilis is performed by chemiluminescent immunoassays;

Stage II-NAT-testing of donor blood samples for the presence of HIV-1,2 RNA, HCV and HBV DNA is performed with a negative result at stage I.

If it is necessary to obtain an emergency result on the infectious safety of donor blood samples, serological screening and NAT testing are performed in parallel.

Receiving negative results of studies of donor blood samples during serological screening and NAT testing is a reason to recognize the blood of donors as uninfected in relation to the studied infections.

64. The following GTI markers are examined during serological screening of donor blood samples:

- 1) HIV-1,2 antibodies and p24 antigen in a combined test;
- 2) surface HBV antigen (HBsAg) in a test with a sensitivity of at least 0.5 IU/ml of the antigen;
- 3) HCV antibodies or HCV antibodies and antigen in a combined test;
- 4) total (general) antibodies to the pathogen of syphilis.

65. The following serological screening results are established:

- 1) negative - coefficient of positivity of the tested blood sample is less than 0.8;

2) primary-reactive (or "in operation") - coefficient of positivity of the test blood sample is higher than 0.8

66. Blood components obtained from donation, in the blood sample of which, according to the result of serological screening, a "primary - reactive" result is established are utilized.

Tactics in relation to the donor is determined by the results of repeated and confirmatory immunological testing of the sample.

67. When receiving a serological screening of the primary reactive result for HIV-1,2 markers, two repeated studies of the blood sample are performed:

first repeated - with preservation of the conditions of the first setting with the same diagnostic reagents;

second repeated - on diagnostic reagents from another manufacturer;

If negative results are obtained in two repeated studies, the sample is considered negative.

Upon receipt of at least one doubtful or positive results in repeated testings of a sample of blood, it is recognized as repeatedly-reactive and should be sent to the laboratory of the Republican state enterprise on right of economic management "Kazakh scientific center for dermatology and infectious diseases" of the Ministry of Healthcare of the Republic of Kazakhstan for conducting confirmatory testing and laboratory diagnosis (hereinafter – the laboratory of scientific center for dermatology and infectious diseases).

68. When receiving a serological screening of the primary reactive result for the presence of surface HBV antigen (HBsAg), two repeated and confirmatory studies of the blood sample are performed:

first repeated - with preservation of the conditions of the first setting with the same diagnostic reagents;

second repeated - on diagnostic reagents from another manufacturer;

confirmatory - on diagnostic reagents, performing the HBsAg neutralization reaction.

If negative results are obtained in repeated and confirmatory studies, the sample is considered negative.

If positive results are obtained in repeated and confirmatory studies, the sample is considered positive.

If the results of repeated and confirmatory studies do not match, the final result is interpreted as uncertain, and the probability of infection of this sample is not excluded.

69. When a primary - reactive result for HCV markers is obtained in serological screening, repeated and confirmatory studies of the blood sample are performed:

first repeated - with preservation of the conditions of the first setting with the same diagnostic reagents;

second repeated - on diagnostic reagents from another manufacturer;
confirmatory – by methods (ELISA, IB), on the reagents belonging to the category of confirmatory.

If negative results are obtained in repeated and confirmatory studies, the sample is considered negative.

If positive results are obtained in repeated and confirmatory studies, the sample is considered positive.

If the results of repeated and confirmatory studies do not match, the final result is interpreted as uncertain, and the probability of infection of this sample is not excluded.

70. When receiving a primary - reactive result for the presence of antibodies to the causative agent of syphilis, repeated studies are performed:

first repeated - with preservation of the conditions of the first setting with the same diagnostic reagents;

second repeated - on diagnostic reagents from another manufacturer;

third - by the ELISA method on test systems that detect antibodies of class G, or by the TPHA method.

If negative results are obtained in repeated and confirmatory studies, the sample is considered negative.

If positive results are obtained in repeated and confirmatory studies, the sample is considered positive.

If the results of repeated and confirmatory studies do not match, the final result is interpreted as uncertain, and the probability of infection of this sample is not excluded.

71. If a negative result is obtained after repeated and confirmatory tests of primary reactive blood samples for the presence of markers of HBV, HCV, syphilis, HIV, the donor shall be suspended from blood donation for a period of 6 months, with further control testing using the methods established for laboratory testing of blood samples for infectious markers in these Requirements.

Admission to blood donation is carried out only after receiving negative results in a control testing.

When receiving primary-reactive results for infection markers after a control testing after 6 months, the donor shall be suspended from donation indefinitely.

72. If a positive result is obtained in repeated and confirmatory studies for the presence of markers of HBV, HCV and syphilis, the donor shall be suspended from blood donation indefinitely.

73. Upon receipt of a re-reactive result for the presence of HIV antibodies, the donor shall be suspended from donation until the results are obtained from the laboratory of the scientific center for dermatology and infectious diseases.

Upon receipt of positive results from the laboratory of the scientific center for dermatology and infectious diseases, the donor shall be suspended from blood donation

indefinitely, upon receipt of doubtful result - the donor shall be suspended until obtaining the final result, upon receipt of negative result, the donor shall be suspended for 6 months.

In case of repeated donor appearance after the six-month period, admission to donation shall be carried out after receiving negative control results of studies.

When receiving primary-reactive results after a control testing for infection markers, the donor shall be suspended from donation indefinitely.

74. Upon receipt of uncertain result during repeated and confirmatory studies for the presence of markers of HBV, HCV and syphilis, the donor shall be suspended from donation for 6 months, with further control test for HTI using the methods established for laboratory testing of samples of donated blood for infectious markers in these Requirements.

In case of repeated appearance of the donor after the six-month period, admission to blood donation shall be carried out after receiving negative results of the control testing.

When receiving primary-reactive results in a control testing for infection markers, the donor shall be suspended from donation indefinitely.

75. Samples of donor blood with negative results in serological screening shall be sent for NAT testing for the presence of genetic material of HIV-1,2, HBV, HCV.

76. During NAT testing, up to 6 mini-samples shall be formed from blood samples sent for the testing.

When establishing a positive result of the minipool testing, a repeated NAT test of each sample of the minipool shall be performed individually, in order to establish a sample that has a positive result of the testing.

Blood components obtained from donations, in which a blood sample, based on the result of an individual NAT test, is found to be positive shall be utilized.

The donor's admission to donation or suspension from donation shall be made based on the results of a control testing.

77. A control testing of donors with a NAT-positive result is performed no earlier than 6 months after receiving a positive result in screening using the methods, established for laboratory testing of donor blood samples for infectious markers in these Requirements.

Additionally, a donor who has tested positive result for HBV DNA provides a test result confirming the absence of antibodies (total) to the heart-shaped HBV antigen (anti-HBcorAg) from the primary healthcare organization at the place of attachment.

A donor who has a single positive result for HBV DNA and a positive result for the presence of antibodies (total) to the heart-shaped HBV antigen (anti-HBcorAg) shall be suspended from donations indefinitely and is not involved in a control testing.

In case of negative results of the control testing, the donor shall be allowed to donate blood; in case of positive results, the donor shall be suspended from blood donations indefinitely.

78. Protocols (reports) on the results of laboratory tests are printed from automatic analyzers, signed by at least two laboratory specialists, one of whom is a doctor, and documents are stored on paper for 5 years.

79. If there is a paperless document flow, the results of laboratory tests from automatic analyzers shall be sent to the information program and, after approval by the responsible doctor, shall be uploaded to the electronic donor cards.

80. The results of immunological testing and NAT-testing in the presence of paperless document flow are generated automatically in the information program, printed in two copies, the data is verified and signed by the responsible doctor. One copy shall be sent for culling of the prepared blood, the second one shall be archived in the laboratory.

If there is no paperless document flow, documentation shall be performed on paper, signed by the responsible medical staff of the laboratory.

81. Information about a donor with positive results of test for HBV and HCV with indication of his personal data shall be transmitted once a month to the territorial healthcare organization at the donor's place of residence for diagnosis.

82. If the results of the testing are positive for syphilis markers, information about the donor with his personal data shall be transmitted once a month to the skin and venereal hospital (dispensary).

83. Personal data shall be transmitted in accordance with the rules of medical ethics and confidentiality.

84. In order to provide an expert assessment of the quality of laboratory testing of donor blood samples for infectious markers, the serum or plasma of donor blood samples from each donation is archived in a volume of at least 1.5 ml.

85. Storage of archival samples of serum or plasma of donor blood with positive and negative results shall be carried out separately in compliance with the conditions of restricted access for 3 years at a temperature of -35°C or lower.

Storage of archival blood samples shall be carried out in a room with authorized access and in compliance with biosecurity measures. After expiration of the archiving period, blood samples shall be utilized on the basis of the act of utilization.

Paragraph 6. Requirements for control the conformity of finished products and sterility of blood products

86. Control for conformity of finished products shall be carried out by means of laboratory testing of the criteria of qualitative and quantitative composition, established in the quality Indicators.

At least 1% of the blood products produced shall be tested, unless otherwise specified in the quality Indicators.

The acceptable percentage of products with deviations is also set in the quality Indicators.

The nomenclature and frequency of selection of blood products samples for laboratory testing of quality shall be established by quarterly plans-tasks, approved by the first head of the organization of blood service.

Withdrawal of control samples of blood products shall be documented.

The results of laboratory testing of the blood products quality shall be recorded in the accounting documentation.

87. If a laboratory testing of a selected sample of blood product reveals a deviation of one or more indicators of quality requirements, such as hemoglobin, hematocrit, hematocrit when adding an additional solution, residual white blood cells, factor VIII, pH by more than 5% from the requirements of quality Indicators, as well as if deviations indicating dangerous changes for the recipient, such as bacterial contamination, high indicators of hemolysis and (or) residual protein and osmolarity, the testing of this sample shall be repeated.

In case of confirmation of the received primary result at repeated laboratory testing, 2-3 additional samples of similar blood products prepared on this day shall be selected and examined.

88. In case of stable detection of deviations of quality requirements indicators from the requirements of quality Indicators in samples, selected for repeated control, all samples of blood products related to this series or prepared in one day shall be removed from sale.

The execution of technological regulations of the blood component shall be checked and, if necessary, a correction shall be made to the production regulations.

89. When confirming the presence of deviations indicating changes dangerous for the recipient, including in the samples taken for repeated control, all similar blood products related to this series or prepared in one day shall be removed from sale.

90. Blood products, removed from sale shall be placed in specially designated areas (premises), and they shall be protected from unintentional use until a final decision is made.

An investigation shall be conducted into the causes that led to deviations in the composition of the blood product, and decision shall be made on:

1) possibility of using these blood products for transfusion;

- 2) possibility of using these blood products for processing or for scientific purposes ;
- 3) recognizing of faulty of these blood products.

91. Blood products that are finally considered unusable shall be utilized. Utilization of unsuitable products shall be documented.

92. If a discrepancy is detected after the delivery of blood products to the medical organization, the following procedure shall be performed:

- 1) possible consequences are analyzed and if a high risk of deterioration in the quality and safety of blood products is detected, the management of the medical organization shall be notified;

- 2) unused non-conforming blood products shall be recalled from the medical organization.

93. Blood products not conforming to the established requirements, transferred to other organizations (for destruction, processing or for scientific purposes) shall be marked as "non- conforming blood product".

The label of the non-conforming blood product is provided with clear visual differences from technological labels and labels of finished blood products and a clearly distinguishable inscription "Not for transfusion", indicating the reason for the non-compliance of this unit of blood product.

94. Laboratory equipment, registered and approved for use on the territory of the Republic of Kazakhstan shall be used for laboratory testing of the quality of blood products and intended for measuring the main hematological and biochemical parameters of human blood, as well as for measuring very low or very high values of hematological and biochemical parameters.

95. When testing the quality of blood products:

- 1) pH measurement is conducted in a closed system to avoid the release of CO₂. The measurement is performed at any temperature, the value by the calculated method is converted to pH + 22°C;

- 2) residual cells in freshly frozen plasma are counted before freezing, and it is possible to reduce the threshold values when including cell elimination procedures in the Protocol;

- 3) in the testing of hemoglobin in the supraventricular fluid of unfrozen reduced erythrocytes and washed erythrocytes, a sample shall be taken in the final portion of the weighing solution remaining in the hemacone of the blood component;

- 4) to count the amount of blood elements in blood products or other biological media (for example, in cord blood, bone marrow) with very low or very high content, the flow cytometry method or the Nageotte camera shall be used;

5) determination of residual leucocytes in leucoreduced blood products (erythrocyte mass, erythrocyte suspension, platelet concentrate), residual cells in plasma, stem cell counting shall be performed by flow cytometry or using a Nageotte camera.

96. To calculate the indicators per unit (dose) of the blood product, the following formulas are used:

$$P \text{ dose} = p \text{ liter} / m; m = 1000/V; V = P / K, \text{ where}$$

P dose – the value of the indicator per unit (dose) of the blood product;

P liter - the value of the indicator calculated per liter of the medium;

V- unit volume (blood product dose in milliliters);

P- weight of the controlled blood product sample in grams;

K- conversion coefficient of density.

Indicators of conversion coefficient of density for some blood products are shown in the table.

Table

Density conversion coefficient for blood products

Name of the blood product	Conversion coefficient of density
Whole blood	1,06
Erythrocyte mass	1,09
Erythrocytes+ sugar (SAGM)	1,06
Leukomass	1,06
Platelets	1,03
Plasma	1,03
Cryoprecipitate	1,03

97. When taking control samples of blood products for laboratory quality testing:

1) it is not allowed to break the tightness of the container containing this blood product;

2) sampling of blood products is performed after they are received and before freezing;

3) for obtaining a sample of the blood product identical to the contents of the container:

the trunk between the main container and the satellite container is freed from the content by gravity flow of the content into the container;

carefully mix the contents in the container with gentle, swaying movements;

the trunk tube is filled with the component.

The measures provided for in paragraphs two, three and four of sub-paragraph 3) of this paragraph are repeated at least 4 times, after which the trunk tube between the

containers is squeezed in two places, a segment of 5-8 cm long is formed. The ends of the segment are sealed and cut off. If a sample of a erythrocyte containing a blood product is taken for testing of free hemoglobin, the ends of the segment are not sealed, but are clamped with metal clips;

the segment with the control sample shall be marked and passed on the invoice for testing.

98. Sampling of platelet concentrate for counting the number of cells shall be performed on the day of procurement of the component. In this case, the trunk between the platelet container and the satellite container is freed from the contents and squeezed at a distance of 8-10 cm from the container.

The platelet container shall be placed on the platelet mixer for at least 1 hour to ensure platelets aggregation and uniform resuspension. After that, the empty tube is filled with platelet concentrate. The procedure is repeated at least 4 times. The main tube is sealed near the platelet container and near the satellite container. The segment is deleted, marked, and transferred to laboratory testing.

99. Selection of cryoprecipitate samples shall be performed after separation of freshly frozen plasma into cryoprecipitate and cryosupernatant plasma. The entire dose of cryoprecipitate is transferred to the laboratory testing.

During quality control of cryoprecipitate, a pool of 6 (six) separate samples of cryoprecipitate of different blood groups shall be formed to conduct a testing for the content of factor VIII during the first and last month of storage.

100. Control of sterility of blood products shall be carried out with the permission of the territorial division of a state body in the field of sanitary and epidemiological welfare of the population to conduct works with microorganisms of the 3rd and 4th groups of pathogenicity.

101. Each dose of prepared donor blood or blood components intended for transfusion is of one series.

Sterility control of products shall be carried out by examining samples selectively removed from the total number of prepared in a volume of at least 1 % (every hundredth container).

102. The testing is carried out without breaking the tightness of the container (polymer container).

For this purpose, devices for selecting the first portion of blood shall be used, built into the system for collecting blood, or sealed sections of trunks of the polymer container.

103. Sterility testing is performed in aseptic boxes.

In addition, boxes with a laminar flow of sterile air are used (in accordance with the operating instructions from the manufacturer).

It is not allowed to work with live microbial cultures in boxes intended for control the sterility of medical biological products.

Sterility testing is performed by direct seeding or by membrane filtration, which is used if the volume of the contents of one product unit exceeds 100 ml.

Systems for determining bacterial contamination of blood products are also used, based on measuring the concentration of oxygen in the air or changes of the level in the acid-base balance (pH) as markers of bacterial growth in accordance with the manufacturer's instructions.

The testing of material for sterility is also performed using express-analyzers. The terms of growing and registration of results are also carried out according to the instructions of the manufacturer of the express-analyzer.

104. Donor blood prepared in field conditions is monitored in the amount of at least 1 sample per week from each field team.

Cryoprecipitate prepared in polymer containers by closed method is controlled in the amount of 1 % of the containers prepared during the working day, but not less than one container.

Plasma prepared by plasmapheresis method is monitored at least once a month, selectively 1-2 samples from the number of containers received for laboratory control.

Washed erythrocytes are selected from each 20-th container of the total number of simultaneously manufactured products, but not less than one dose. When producing less than five doses at a time, control by bacteriological seeding of wash water is allowed. Washed erythrocytes are used during their shelf life until the results of a bacteriological testing are obtained, which is carried out retrospectively.

Concentrates of granulocytes and platelets with a shelf life of 24 hours after blood preparation are not subject to sterility control.

Platelet concentrates with a shelf life of more than 24 hours at a temperature of + 20 ° C - + 24 ° C are controlled selectively in an amount of at least 1 sample from the number of containers prepared during the working day.

Cryopreserved long- term storage erythrocytes prepared for freezing are monitored for sterility before glycerization (about 10 ml is taken into a satellite bag) and after glycerization (from the erythromass remaining in the polymer container after transferring it to a cryocontainer), and during thawing - after their deglycerinization (5 ml from each dose of red blood cells). Selection of samples is performed in sterile dry containers.

105. Preparation for testings shall be performed:

1) all samples of products delivered to the laboratory (sealed sections of the trunk of the polymer container or gemakon) are checked visually for the integrity of the capping, registered in the working journals, and then entered in the prebox;

2) polymer containers (gemakon), sealed sections of trunks, ampoules with test samples are processed with ethyl alcohol with a volume fraction of 70%. It is possible to use other disinfecting solutions;

3) when receiving products in cloth or paper packaging, the outer layer is removed in the pre-box and the product in the inner package is immediately transferred to the box;

4) in the pre-box, hands are washed thoroughly with soap, wiped with a disposable towel, a disposable robe, cap, mask, slippers or shoe covers are put on;

5) before starting the testing on the sterility of product samples, hands are treated with antiseptic agents or 70% ethyl alcohol, disposable gloves are worn, which are disinfected every 15 minutes during operation;

6) all tools and materials are placed on the tray during operation.

106. Direct seeding into nutrient media shall be carried out by the method of:

1) material from the tested samples is sown directly in test tubes with nutrient media during direct seeding;

2) before seeding liquid preparations, the contents of ampoules or bottles are shaken, since microbes-contaminants can settle to the bottom;

3) samples of dry preparations are pre-dissolved with a sterile solvent in the volume indicated on the label;

4) pre-sterilized tools are placed in a container with 95 % ethyl alcohol and fired in a burner flame when working with each product sample;

5) the ends of ampoules or bottle necks before opening are treated with 95 % ethyl alcohol and burned over the flame of the burner.

107. Blood and its components are seeded by 1.0-2.0 ml in two test tubes containing 10 ml of thioglycol medium. One tube with seeding in a thioglycol medium is incubated at a temperature from +35°C to +37°C, the other-at a temperature from +22°C to +25°C.

108. Test tubes with primary seedings are stored in thermostats until the end of the sterility control process. The total incubation period of the primary seeding is 72 hours (3 days). A daily review of the seedings in passing light shall be carried out before the end of the incubation period of the samples and the results of review are recorded daily in the working register journal.

109. The marked trunk (segment) of the hemacon with the biomaterial is clamped with a sterile clip during seeding, the ends of the trunk are quickly passed through the flame of the burner., The ends of the trunk are cut off 2 mm from the sealing point with sterile scissors, and once again held over the flame of the burner. The clamp is loosened, and the required amount of seeding material is forced into the test tubes with the nutrient medium.

110. Seeding of samples by direct seeding and filtration method is carried out in accordance with the requirements of the State pharmacopoeia of the Republic of Kazakhstan.

111. Interpretation of the results of the sterility test is performed when viewing the seedings in passing light daily until the end of incubation period of the samples and the results of viewing are recorded daily in the working register journal.

Presence of growth of microorganisms in nutrient media is assessed visually by the appearance of turbidity, coatings, sediment and other macroscopic changes.

The detected growth of microorganisms is confirmed by microscopy of smears colored by Gram (in any modification).

112. In case of sprouting blood component sample during the first or second day after seeding, the reason for the growth shall be determined and the question of whether to recall the sold and unrealized products prepared on the same day is resolved.

113. 2-3 sample of blood (its components) are taken for repeated control on the terms and conditions of procurement corresponding to the primary samples, and in the case of re-growth the whole blood plasma is only used for processing drugs, red blood cell-containing blood components utilized.

114. In case of sprouting of a cryoprecipitate sample prepared by a closed method, 2-3 containers are selected for repeated control from the total number of doses of cryoprecipitate from the same day of procurement, and in case of bacterial growth of cryoprecipitate from at least one container, all doses prepared on this day are rejected.

115. From a series of cryoprecipitate prepared by the open method, containers with samples of bacterial growth are removed for re-seeding to find out its cause. Containers with no growth of micro-organisms in the samples are considered to meet the requirements of the sterility test.

116. To control the sterility of blood and its components during their storage, at least one sample from the number of stored samples is seeded monthly.

117. In case of repeated sprouting of washed and unfrozen red blood cells, the wash water from each washing procedure is additionally controlled to find out the reasons for their infection.

118. Before receiving a conclusion on the sterility of the sample, the use of blood components shall be carried out within the first three days from the moment of their procurement, if upon sterility control, the tested samples were sterile during the previous three months of operation.

119. The results of sterility control are recorded.

120. They are subjected to bacteriological observation:

1) the efficiency of operation of sterilizing apparatus;

- 2) sterility of primary packaging materials (tools, dressings, underwear and other materials that are subject to sterilization);
- 3) microbial contamination of the air of aseptic boxes and individual production premises, hands of the personnel and skin of elbow bends of donors;
- 4) the quality of pre-sterilization cleaning of medical-purpose items (azopyram test)

121. The method and technique of seeding of sterilized products is used when:

- 1) sterility of products is determined at least once a month and not earlier than 24 hours after sterilization. A thioglycol medium is used to control sterility;

- 2) sterility control is applied to: medical instruments, dressings, tableware (bottles, vials, ampoules), test tubes, pipettes and other products;

- 3) sterility is checked by flushing or by immersion of the sterilized product or part of it in nutrient media;

- 4) when flushing, simultaneous seeding of products (or their individual nodes and components) is performed in 2 test tubes containing at least 10 ml of the above-mentioned nutrient medium. The container is filled with a volume of medium sufficient for complete immersion of the sample;

- 5) crops are kept in a thermostat: one tube with a thioglycol medium at a temperature in the range from +35°C to +37°C, the second tube with a thioglycol medium is incubated at +22°C to +25°C, for eight days. When the nutrient medium becomes cloudy, smears are made, which are colored by Gram, and microscopy is performed.

122. Control of microbial contamination of the air of aseptic boxes and individual industrial premises (determination of the number of colonies of forming microorganisms (CFU) contained in 1 m³ of room air) is carried out by examining the air by aspiration and sedimentation method.

Air samples are taken by aspiration method using the Krotov device, PUB, POV-1 and other similar models. The speed of drawing air through the device is 25 liters/minutes.

To determine the total content of microorganisms, 100 liters of air is passed, and to determine the St. Aureus 250 liters of air is passed.

If there are no samplers, it is allowed to test the microflora of indoor air by sedimentation (settling) of microflora on Petri dishes with agar media.

Selection of samples is performed on 2 cups of meat-peptone agar (MPA) for 10 minutes to determine the total air contamination and on yolk-salt agar (YSA) for 20 minutes to determine the content of St. Aureus.

Selection of air samples is performed in compliance with the following conditions:

- 1) the level of sampling height should correspond to the height of the working table

;

- 2) closed windows and doors;
- 3) not earlier than 30 minutes after wet cleaning of the room and switching off the germicidal lamps.

Seedings are incubated at a temperature of +35°C to +37°C for 24 hours, then left for 24 hours at a temperature in the range of +22°C to +25°C. Then, the total number of grown colonies on 2 Petri dishes are counted and recalculated to the number of microorganisms in 1 m³ of air, the arithmetic mean value (the sum of the number of bacteria grown on 2 Petri dishes) is calculated which is divided by 2, the resulting number is multiplied by 80 (with diameter of Petri dishes 9 cm - square of the cup is 80 cm²) and in this case the number of colonies in 1 m³ of air is obtained.

Example of calculation: on 2 cups with a diameter of 9 cm, 7 colonies grew, first the arithmetic mean of the total number of colonies in both cups is calculated, by adding the number of colonies in both cups and dividing the resulting amount by the number of cups (in this example by 2), then the resulting value (7) is multiplied by the area of the cup (in this example, 80 cm²), as a result, the number of colony-forming units is determined in this example, this number was 560 CFU/ m³). If the cup diameter is 8 cm, the multiplier is 100; the presence and quantity of mold fungi is specified separately.

123. To detect *St. Aureus* seeding on one of the nutrient media is conducted: yolk-salt, milk-salt or milk-yolk-salt agar or on other nutrient media registered and allowed for use on the territory of the Republic of Kazakhstan.

After incubation, the cups are viewed to determine the nature and massiveness of the growth of colonies, followed by removal of *Staphylococcus* colonies forming an iridescent corolla and pigmented colonies from dense salt media to a slanted nutrient agar. In the absence of pigmented colonies and colonies with positive lecithovitellase activity on the cups, non-pigmented colonies and colonies with no lecithovitellase activity, similar in morphology to *Staphylococcus*, are removed for testing. At least 2 colonies of various types are selected.

Tubes with seedings are placed in a thermostat at a temperature from +35°C to +37°C for 18-20 hours. After daily incubation, the morphology, tinctorial properties (Gram stain) and the presence of plasma-coagulating activity and flake-forming factor are checked in the selected strains.

To identify coagulase-positive staphylococci, 2-3 available tests are used in addition to the plasma coagulation reaction.

The belonging of culture with a typical morphology, plasma-coagulating activity, in the absence of pigment and flocculation, to the type of coagulase-positive staphylococci is determined by the table.

Microbiological purity of substances and excipients used in the production of blood products

Type of Staphylococcus	Coagulase	Pigment	Voges-Proskauer Reaction	Acid production under aerobic conditions from		Flocculation	Hemolysis
				Mannitol	Maltose		
St. aureus	+	+	+	+	+	+	+
St. intermedius	+	-	-	+/-	+/-	+/-	+
St. hyicus	+	-	-	-	-	-	-

124. Control of sterility of the efficiency of processing the hands of personnel during the production process of blood procurement and processing is performed selectively at several employees, at least once a week, and the skin of the elbow bends of donors - at least twice a week. Washes from the elbow bends are taken in the amount of 3% of donations.

Checking the effectiveness of processing personnel's hands is performed using one of the following methods:

1) Taking the flush from the palm, the periarticular and interdigital spaces of both hands of the personnel.

Sterile cotton swabs on glass, metal or wooden sticks mounted in test tubes with cotton plugs are prepared in advance in the laboratory (10 ml of thioglycol medium is poured into each test tube with a tampon in a box so that the cotton swab does not touch the liquid).

Immediately before taking the flush, the tampon is moistened by lowering it into the thioglycol medium.

2) Fingers touch the surface of the dense nutrient medium (MPA) in the Petri dish and make several circular movements.

Checking the effectiveness of processing the elbow bend of the donor is performed 3-4 cm below the venipuncture site using sterile moistened cotton swabs with a thioglycol medium.

"Seeded" cups and test tubes with tampons are thermostated at a temperature in the range of + 22, +35 ° C for two days.

Normally, the skin of the elbow bends of donors and the hands of medical personnel should be sterile.

125. In the premises where testings on the sterility of blood, its components and preparations are conducted, control of sterility of working conditions is carried out.

126. The following types of testings are performed for intra laboratory sterility control:

- 1) sterility of each batch of prepared nutrient medium;
- 2) microbial contamination of the air in the box;
- 3) cleanliness of employees' hands when working in the box;
- 4) work of dry-heat cabinets and autoclaves;
- 5) operation of thermostats;
- 6) temperature mode of refrigerators;
- 7) control samples using obviously sterile preparations.

127. Every day, the surfaces and equipment of the box and pre-box are subjected to a thorough wet cleaning with sterile rags using any disinfectants and detergents registered in the Republic of Kazakhstan and authorized for use by bodies and institutions of State sanitary and epidemiological supervision. The working solution of disinfectants and detergents is prepared in concentration in accordance with approved guidelines.

The rate of consumption of disinfectants is 100-150 ml/m².

128. The box is processed in rubber gloves and a gauze mask, and if necessary - in a respirator.

129. To disinfect the air in the box, bactericidal lamps are used at the rate of 2-2.5 watts of power per cubic meter, which are turned on no earlier than 30 minutes after the end of wet cleaning. Irradiation is conducted for 1.5-2 hours. The time of operation of bactericidal lamps is recorded in special journals. The use of bactericidal lamps must comply with their technical data according to the passport.

130. General cleaning of the box is carried out once a week with disinfectants in the concentration specified in the instructions for viral and fungal infections. After the general cleaning, the bactericidal lamps are switched on for 2 hours.

131. If fungi and mold are found in the air of boxes, an extraordinary general cleaning shall be carried out.

132. Alternation of disinfectants is performed to prevent the appearance of resistant forms of microorganisms.

133. Test tubes (bottles, flasks) with bacterial growth of products are utilized after disinfection.

After work, nutrient media without bacterial growth are collected in containers and after decontamination are drained into the sewer.

134. Used laboratory utensils (Petri dishes, test tubes, flasks, bottles, etc.) and rubber pears are placed in a 4% solution of hydrogen peroxide with 0.5% detergent or any disinfectant with a washing effect registered in the Republic of Kazakhstan. In pipettes, before immersion in the solution, this solution is pre-sucked using a rubber canister. Exposure is maintained to ensure reliable disinfection and pre-sterilization

cleaning. Dishes are washed with ruffs in the same solution and repeatedly (8-10 times) rinsed first with ordinary running water until the smell of the disinfectant is completely removed, and then with purified water, after which they are further processed.

135. Dishes are dried at room temperature (cold drying) or in a dry cabinet at a temperature of + 85-900C. The dried dishes are viewed in the light. The glass must be completely transparent without any frosted coating or spots. Dry dishes are closed (stoppers are inserted into test tubes, bottles, lids are selected for Petri dishes) and placed in pencil cases or wrapped in paper. For flasks and bottles, the neck is additionally wrapped with paper caps.

136. Dishes are sterilized with dry hot air at a temperature of 1800C-1900C-60 minutes, at a temperature of 1600C-1700C-150 minutes, or with saturated steam under excessive pressure at 2.0 (± 0.2) kgf/cm² /+132 +1340 S / - 20-22 minutes, at 1.1 (± 0.2) kgf / cm² /+1200C - + 1220C/ - 45-48 minutes.

137. Preparation of nutrient media for testings (cooking, bottling, sterilization, storage) is carried out in accordance with the manufacturer's instructions.

Control of each prepared batch of nutrient media after autoclaving provides for an assessment of their quality by sterility by thermostating control samples (at least 2 % of the batch) for 48 hours.

138. Control samples of a thioglycol medium intended to detect bacteria are incubated for 48 hours at a temperature of +35 to +370C.

139. The profitability analysis is carried out by visual inspection of the samples. During thermostating, the growth of microorganisms should not be observed. In the case of sprouting (turbidity) of the medium in the samples left for control, the entire batch is rejected. Samples of media kept in a thermostat are not used for testings.

140. Simultaneously with the tested samples of products, parallel control of nutrient media (at least one sample of each nutrient medium) is carried out during the entire period of their thermostating.

Appendix 1
to the Requirements for medical
examination of donors of
blood and its components and
safety and quality in the
production of blood products
for medical use

Standards of laboratory tests for donors of blood and its components

№ п/п	Indicators	Fluctuations range	Acceptable methods of testing

1.	Hemoglobin	Men are not less than 120 grams/liter (hereinafter - g/l), Women - at least 110 g/l	Colorimetric method Automatic analyzer
2.	Number of erythrocytes	Men - (4,0-5,5)x10 ¹² cells/liter (hereinafter - cl/l) Women - (3,7-4,7)x10 ¹² cl/l	Automatic analyzer Goryaev's camera
3.	ESR	Men no more than 10 mm per hour (hereinafter-mm/hour) Women no more than 15 mm/hour	Panchenkov's micromethod Vestergren method* Automatic analyzer* *- in this case, the norms may change
4.	Platelets number	Not less than 160x10 ⁹ cl/l	Goryaev's camera Counting in a colored blood smear Automatic analyzer
5.	Number of leucocytes	(4,0-9,0) x 10 ⁹ cl/l	Goryaev's camera Automatic analyzer
6.	Blood coagulation time	5 - 10 minutes	The Lee- White method, Sukharev's method
7.	Alanine aminotransferase (ALT)	According to the reagent manufacturer's instructions	Kinetic method

Appendix 2
to the Requirements for medical
examination of donors of
blood and its components and
safety and quality in the
production
of blood products for
medical use

Criteria for permanent suspension from donation of blood and its components

№ п/ п	Names
1.	Infectious diseases: hepatitis B and C, HIV infection, syphilis, tuberculosis (all forms), tularemia, typhoid fever, leprosy, positive test result for markers of viral hepatitis B, C, HIV syphilis
2.	Injecting drug use
3.	Parasitic diseases: echinococcosis, toxoplasmosis, trypanosomiasis, filariasis, guinea worm disease, leishmaniasis
4.	Subacute transfusion spongiform encephalopathies (hereinafter - STSE): Kuru, Creutzfeldt- Jakob disease, Gerstmann-Streusler syndrome, persons with a family history of STSE, amyotrophic leukospongiosis
5.	Availability in the anamnesis of information about treatment with human pituitary drugs, growth hormones
6.	Cardiovascular diseases: hypertension of II-III degree; ischemic heart disease; atherosclerosis; atherosclerotic cardiosclerosis; obliterating endarteritis; non- specific aortoarteritis; recurrent thrombophlebitis; endocarditis; myocarditis; heart defects (congenital and acquired)
7.	Respiratory diseases with signs of respiratory failure in the decompensation stage
8.	Chronic liver diseases (hepatitis, including toxic and unclear etiology, cirrhosis of the liver)
9.	Diseases of the kidneys and urinary tract in the decompensation stage

10	Diseases of the endocrine system with irreversible disorders of functions and metabolism, diabetes mellitus (insulin- dependent form)
11	Organic diseases of the central nervous system
12	Diffuse connective tissue diseases
13	Radiation sickness
14	Diseases of the visual organs: complete blindness
15	Skin diseases: generalized psoriasis, vitiligo, deep mycoses
16	Diseases of the otolaryngological organs: ozen, chronic purulent-inflammatory diseases with a severe course
17	Malignant neoplasms and blood diseases
18	Endured operations with the removal of a limb; with the removal of a parenchymal and/or hollow organ or part of an organ (liver, kidneys, lung, stomach)
19	Osteomyelitis acute and chronic
20	Transplantation of organs
21	Complete lack of hearing and speech
22	Confirmed history of anaphylaxis
23	Autoimmune diseases with damage to more than one organ
24	Established genetic diseases
25	Mental and behavioral disorders
26	Proven facts of risky behaviors – providing sexual services, conducting promiscuous sexual relations

Note:

the criteria for permanent suspension from donation do not apply to peripheral blood hematopoietic stem cell donors whose documented decision to allow donation is made by a responsible person.

Appendix 3
to the Requirements for medical
examination of donors of
blood and its components and
safety and quality in the
production of blood products
for medical use

Criteria for temporary suspension from donation of blood and its components

№ п/п	Name	The period of temporary suspension
1. Risk factors for infection with hemotransmissible infections		
1.	Transfusion of blood and its components (except for burn convalescents and persons immunized to the Rh factor)	12 months
2.	Surgical interventions, including abortion, appendectomy, cholecystectomy, the organs of the reproductive system and ambulatory surgery	4 months
3.	Allogeneic blood getting on the mucous membrane or injection with needle prick	4 months
4.	Introduction of allogeneic stem cells	4 months
5.	Corneal and dura mater transplantation	4 months
6.	Acupuncture, tattoos and piercings	4 months
7.	Household contact with patients with hepatitis B , C (established according to the words of the donor)	6 months
8.	Household contact with patients with hepatitis A (established according to the words of the donor)	35 days
9.	Stay for more than 4 months in countries with tropical and subtropical climates that are endemic for diseases with transfusion-based transmission (Asia, Africa, South and Central America)	after 4 months admission to donation in the presence of a negative preliminary test for malaria
10.	Tooth extraction	10 days in the absence of complications (due to the risk of accidental bacteremia)
11.	Unproven facts of risky forms of behaviour – providing sexual services, conducting promiscuous sexual relations	4 months
12.	The period of temporary suspension of the donor in case of unconfirmed primary-reactive results for the presence of markers of HBV, HCV, syphilis, HIV	6 months with subsequent control examination
13.	The period of temporary suspension of the donor in case of detection of increased ALT activity	1 month with subsequent control examination
14.	The period of temporary suspension of the donor in case of rejection of the results of a general clinical laboratory examination	1 month with subsequent control examination
15.	The period of temporary suspension of the donor in case of deviation of the total protein index	1 month with subsequent control examination
2. Past illnesses and vaccinations		
16.	Malaria	4 months from the moment of complete clinical and laboratory recovery
17.	Brucellosis (confirmed by laboratory methods)	2 years from the moment of complete clinical and laboratory recovery
18.	Typhoid fever	1 year from the moment of complete clinical and laboratory recovery in the absence of pronounced functional disorders
19.	Angina	1 month from the moment of recovery

20	Flu, acute respiratory viral infection	2 weeks after recovery with satisfactory health
21	Infectious diseases that do not meet the criteria for permanent suspension	6 months from the moment of recovery
22	Acute and chronic inflammatory diseases in the acute stage regardless of localization	1 month from the moment of recovery or relief of the acute period
23	Acute glomerulonephritis	5 years after complete confirmed recovery
24	Allergic diseases in the acute phase	2 months from the moment of acute period relief
25	Vegetative vascular dystonia	1 month after treatment
26	Q-fever	2 years from the moment of full clinical recovery
27	Pregnancy, childbirth and lactation	1 year after birth
28	Vaccinations with killed vaccines (hepatitis B, pertussis, paratyphoid, flu, toxoids, tetanus, diphtheria, and others).	2 weeks
29	Vaccination with live vaccines (brucellosis, plague, tularemia, tuberculosis, measles, rubella, mumps, live weakened typhoid vaccine, live weakened cholera vaccine, polio, and others).	4 weeks
30	Vaccination against rabies, tick- borne encephalitis.	1 year after contact with the source of infection.
31	Mantoux reaction (in the absence of pronounced inflammatory phenomena at the injection site)	2 weeks
3. Related to changes in overall health and other factors		
32	Alcohol use	48 hours
33	Taking an antibiotic	2 weeks after the end of intake
34	Taking analgesics, salicylates	3 days after the end of intake
35	Heart rate below 50 and above 100 beats per minute, arrhythmia	48 hours
36	Systolic pressure above 180 mm Hg (hereinafter- mmHg) .art.) or below 100 mm Hg.st.	48 hours
37	Diastolic pressure above 100 mmHg. art. or below 60 mm Hg. st.	48 hours
38	Body temperature above 38°C	2 weeks
39	Work in the night shift on the eve of blood supply.	24 hours
4. Related to an adverse epidemiological situation		
40	Epidemiological situations (for example, disease outbreaks)	Suspension in accordance with the epidemiological situation determined by the authorized body in the field of healthcare

Note:

If the donor has diseases and symptoms that are not included in this list, the question of donation is decided by the doctor conducting medical examination, if necessary, after consulting with a specialist of the appropriate profile.

Appendix 4
to the Requirements for medical
examination of donors of
blood and its components and
safety and quality in the
production of blood products
for medical use

Minimum intervals between different types of donations of blood and its components

№ п/ п	Original procedure	Subsequent procedure					
		Whole blood donation	Plasmapheresis one fold	Plasmapheresis dualfold or plasmapheresis hardware	Thrombocytapheresis	Erythrocytapheresis one fold	Erythrocytapheresis dualfold
1.	Whole blood donation	60 days	30 days	30 days	30 days	60 days	90 days
2.	Plasmapheresis one fold	7 days	7 days	7 days	7 days	7 days	7 days
3.	Plasmapheresis dualfold or plasmapheresis hardware	14 days	14 days	14 days	14 days	14 days	14 days
4.	Thrombocytapheresis	14 days	14 days	14 days	14 days	14 days	14 days
5.	Erythrocytapheresis one fold	60 days	30 days	30 days	30 days	60 days	90 days
6.	Erythrocytapheresis dualfold	120 days for men 180 days for women	60 days	60 days	60 days	120 days for men 180 days for women	120 days 180 days for women

Note:

When donating plasma (including immune) - plasma is prepared in a volume of no more than 20 liters per year, taking into account the anticoagulant. After each 20 consecutive plasma or platelet donations, the donor shall be given a rest for period of one month.

When donating erythrocytes by apheresis, erythrocytes are prepared within a year in a volume identical to the loss of erythrocytes during the donation of whole blood for the same period.

The interval between procedures in exceptional circumstances (in the absence of a donor with the required blood group) is reduced at the discretion of the doctor conducting medical examination of the donor.

The procedure of plasmapheresis with the failed return of erythrocytes to the donor at intervals between different types of donations of blood and its components is equivalent to the donation of the whole blood.

Preparation of blood in small doses is carried out no more than 3 times a week in the amount of 10-30 milliliters of whole blood.

Maximum frequency of blood donation:

for men donors – 6 doses in a volume of 450 ml \pm 10% per year;

for female donors-4 doses of 450 ml \pm 10% per year.

The frequency and multiplicity of peripheral blood HSC donations is determined in accordance with the initial level in the peripheral blood of CD34+ in the amount of 20 cells per microliter or more and the level of CD34+ cells in the final product of at least 2×10^6 per kilogram of body weight of the recipient.

Appendix 5
to the Requirements for medical
examination of donors of
blood and its components and
safety and quality in the
production
of blood products
for medical use

Quality indicators of donated blood and its components

1. Blood whole

Definition

Blood whole – blood obtained from a healthy, medically examined donor.

Receiving

Blood whole is prepared in a sterile apyrogenic container with an anticoagulant and , by definition, no preparation is required to obtain Blood whole.

Using

Blood whole is used:

for preparation of blood components;

for transfusion without further processing, or when there is clinical evidence, shall be subjected to ionizing irradiation to loss of viability of the lymphocytes to prevent "graft versus host" reaction at immunocompromising patients with intrauterine transfusions, transfusion from relatives, and any other patient groups.

Quality criteria

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Verification parameter	Quality requirements (specification)	Control frequency*	Who controls it
ABO, Rh (D)	Typing	All doses	Department of blood testing and laboratory researches
ALT	Not increased	All doses	
HBsAg	Negative in an approved screening test	All doses	
Anti-HCV	Negative in an approved screening test	All doses	
Anti-HIV 1.2	Negative in an approved screening test	All doses	
Syphilis	Negative in screening test	All doses	
Volume	450 ml \pm 10 % of the volume without anticoagulant. Non-standard donations must be marked accordingly.	1 % of all doses, at least 4 doses per month	Department of preparation of blood and its components
Hemoglobin	At least 45 g/dose	4 doses per month	Department for quality control of blood products
Hemolysis at the end of storage	No more than 0.8 % of red blood cells	4 doses per month	

Note: * - Parameter "control frequency", if it is different from the value "All doses", displays the minimum frequency of testing and indicates the necessity for statistical control of the process to reduce the risk of deviations in the quality of the blood component.

Storage and transportation

Blood whole intended for transfusion shall be stored at a temperature from +2°C to +6°C. Shelf-life depends on the used anticoagulant or preservative solution, for example, when using CFDA-1, shelf-life is 35 days.

Blood whole for preparation of blood components shall be stored at a temperature from + 20°C to +24°C for 24 hours, which allows to prepare a platelet concentrate from it.

Transportation is carried out in a specialized thermal container that allows to keep the temperature no higher than +10°C for at least 24 hours of transportation.

Marking

Information is recorded on the label:

name of the organization-manufacturer;

unique identification number of the donation;

name of the blood component;

blood group according to ABO system and Rhesus affiliation Rh (D);

blood group phenotype (if necessary);

date of donation;

expiration date;

name of the anticoagulant;

note on additional processing (irradiance);

volume;
storage temperature;
information about pre-transfusion procedures;
information that the component is introduced through a filter with a pore size of 150-200 micrometers (hereinafter - microns).

Precautionary measures

Prior to transfusion compatibility checking of the Blood whole with the blood of the recipient is carried out.

Adverse reactions

When transfusion the Blood whole there are risks of developing conditions:
hemolytic post- transfusion reaction;
non- hemolytic post-transfusion reaction (most often-chills, fever, urticaria);
anaphylaxis;
alloimmunization by erythrocyte and HLA antigens;
the syndrome of acute lung injury due to transfusion (SALI);
post-transfusion purpura;
“graft versus host” reaction;
sepsis, caused by accidental bacterial contamination;
transmission of viral infection (hepatitis, HIV, and others) is not excluded, despite the careful selection of the donor and examination of the donor's blood by modern methods;
risk of transmission of protozoal infection (malaria);
transmission of other unidentified or non-mandatory screening pathogens;
citrate intoxication in newborns and patients with impaired liver function;
metabolic disorders in massive transfusions (hyperkalemia, other);
iron overload;
circulatory overload.

2. Blood whole leukofiltered

Definition

Blood whole leucofiltered - a component of blood obtained from the Blood whole by removing leucocytes to the maximum residual content.

Preparation

Blood whole leucofiltered is obtained when leucocytes are removed by filtration within 48 hours after donation.

Using

Blood whole leucofiltered is used:
for preparation of blood components;

for transfusion without additional processing, or in presence of clinical indications, shall be subjected to ionizing irradiation for deprivation the lymphocytes viability to prevent "graft versus host" reaction in immunocompromised patients during intrauterine transfusions, during transfusion from relatives, and for any other groups of patients.

Quality criteria

Verification parameter	Quality requirements (specification)	Control frequency*	Who controls it
ABO, Rh (D)	Typing	All doses	Department of blood testing and laboratory researches
ALT	Not increased	All doses	
HBsAg	Negative in an approved screening test	All doses	
Anti-HCV	Negative in an approved screening test	All doses	
Anti-HIV 1.2	Negative in an approved screening test	All doses	
Syphilis	Negative in screening test	All doses	
Volume	450 ml \pm 10 % of the volume without anticoagulant. Non-standard donations must be marked accordingly.	1 % of all doses, at least 4 doses per month	Department of preparation of blood and its components
Hemoglobin	At least 43 g/dose	1 % of all doses, at least 4 doses per month	Department for quality control of blood products
Residual leucocytes **	<1x10 ⁶ in the calculated dose	1 % of all doses, at least 4 doses per month	
Hemolysis at the end of storage	No more than 0.8 % of red blood cells	4 doses per month	

Note: *- Parameter "control frequency", if it is different from the value "All doses", displays the minimum frequency of testing and indicates the necessity for statistical control of the process to reduce the risk of deviations in the quality of the blood component.

** - The requirements are met if 90% of the tested doses fall within the range of the indicated values.

Storage and transportation

Blood whole leucofiltered – shall be stored at a temperature from +2°C to +6°C. Shelf-life depends on the used anticoagulant or preservative solution, for example, when using CFDA-1, shelf-life is 35 days.

Transportation is carried out in a specialized thermal container that allows to keep the temperature no higher than +10°C for at least 24 hours of transportation.

Marking

Information is recorded on the label:

name of the organization-manufacturer;

unique identification number of the donation;
name of the blood component;
blood group according to ABO system and Rhesus affiliation Rh (D);
blood group phenotype (if necessary);
date of donation;
expiration date;
name of the anticoagulant;
note on additional processing (irradiance);
volume;
storage temperature;
information about pre-transfusion procedures;
information that the component is introduced through a filter with a pore size of 150-200 micrometers.

Precautionary measures

Prior to transfusion compatibility checking of the Blood whole leucofiltered with the blood of the recipient is carried out.

Adverse reactions

When transfusion the Blood whole leucofiltered there are risks of developing conditions:

hemolytic post- transfusion reaction;
non- hemolytic post-transfusion reaction (most often-chills, fever, urticaria);
anaphylaxis;
alloimmunization by erythrocyte and HLA antigens;
the syndrome of acute lung injury due to transfusion (SALI);
post-transfusion purpura;
“graft versus host” reaction;
sepsis, caused by accidental bacterial contamination;
transmission of viral infection (hepatitis, HIV, and others) is not excluded, despite the careful selection of the donor and examination of the donor's blood by modern methods;
risk of transmission of protozoal infection (malaria);
transmission of other unidentified or non-mandatory screening pathogens;
citrate intoxication in newborns and patients with impaired liver function;
metabolic disorders in massive transfusions (hyperkalemia, other);
iron overload;
circulatory overload.

3. Erythrocyte mass (EM)

Definition

Erythrocyte mass- a component of blood obtained from Blood whole, contains most of the leucocytes of whole blood and a different number of platelets, their content depends on the method of centrifugation.

Preparation

Erythrocyte mass is obtained by removing most of the plasma from the Blood whole after centrifugation.

Using

Erythrocyte mass is used for transfusion without additional processing, or in presence of clinical indications, shall be subjected to ionizing irradiation for deprivation the lymphocytes viability to prevent "graft versus host" reaction in immunocompromised patients during intrauterine transfusions, during transfusion from relatives, and for any other groups of patients.

Quality criteria

Verification parameter	Quality requirements (specification)	Control frequency*	Who controls it
ABO, Rh (D)	Typing	All doses	Department of blood testing and laboratory researches
ALT	Not increased	All doses	
HBsAg	Negative in an approved screening test	All doses	
Anti-HCV	Negative in an approved screening test	All doses	
Anti-HIV 1.2	Negative in an approved screening test	All doses	
Syphilis	Negative in screening test	All doses	
Volume	280 ± 50 ml	1 % of all doses	Department of preparation of blood and its components
Hemoglobin	At least 45 g/dose	at least 4 doses per month	Department for quality control of blood products
Hematocrit	0,65 - 0,75	at least 4 doses per month	
Hemolysis at the end of the storage period	No more than 0.8 % of red blood cells	4 doses per month	

Note: *- Parameter "control frequency", if it is different from the value "All doses", displays the minimum frequency of testing and indicates the necessity for statistical control of the process to reduce the risk of deviations in the quality of the blood component.

Storage and transportation

The erythrocyte mass shall be stored at a temperature from +2°C to +6°C, shelf-life depends on the used anticoagulant or preservative solution, for example, when using CFDA-1, shelf-life is 35 days.

Transportation is carried out in a specialized thermal container that allows to keep the temperature no higher than +10°C for at least 24 hours of transportation.

Marking

Information is recorded on the label:

name of the organization-manufacturer;

unique identification number of the donation;

name of the blood component;

blood group according to ABO system and Rhesus affiliation Rh (D);

blood group phenotype (if necessary);

date of donation;

expiration date;

name of the anticoagulant;

note on additional processing (irradiance);

volume;

storage temperature;

information about pre-transfusion procedures;

information that the component is introduced through a filter with a pore size of 150-200 microns.

Precautionary measures

Prior to transfusion compatibility checking of the Erythrocyte mass with the blood of the recipient is carried out.

Adverse reactions

When transfusion the Erythrocyte mass there are risks of developing conditions:

hemolytic post- transfusion reaction;

non- hemolytic post-transfusion reaction (most often-chills, fever, urticaria);

anaphylaxis;

alloimmunization by erythrocyte and HLA antigens;

the syndrome of acute lung injury due to transfusion (SALI);

post-transfusion purpura;

“graft versus host” reaction;

sepsis, caused by accidental bacterial contamination;

transmission of viral infection (hepatitis, HIV, and others) is not excluded, despite the careful selection of the donor and examination of the donor's blood by modern methods;

risk of transmission of protozoal infection (malaria);

transmission of other unidentified or non-mandatory screening pathogens;

citrate intoxication in newborns and patients with impaired liver function;

metabolic disorders in massive transfusions (hyperkalemia, other);

iron overload;

circulatory overload.

4. Erythrocyte mass with removed leukothrombocyte layer

Definition

Erythrocyte mass with removed leukothrombocyte layer (hereinafter-Erythrocyte mass with removed LTL) - a component of blood obtained from the Blood whole, contains leucocytes at a dose of less than $1, 2 \times 10^9$ and a different number of platelets, which depends on the method of centrifugation.

Preparation

Erythrocyte mass with removed LTL is obtained by removing most of the plasma and 20-60 ml of the leukothrombocyte layer from the Blood whole after centrifugation.

Using

Erythrocyte mass with removed LTL is used for transfusion without additional processing, or in presence of clinical indications, shall be subjected to ionizing irradiation for deprivation the lymphocytes viability to prevent "graft versus host" reaction in immunocompromised patients during intrauterine transfusions, during transfusion from relatives, and for any other groups of patients.

Quality criteria

Verification parameter	Quality requirements (specification)	Control frequency *	Who controls it
ABO, Rh (D)	Typing	All doses	Department of blood testing and laboratory researches
ALT	Not increased	All doses	
HBsAg	Negative in an approved screening test	All doses	
Anti-HCV	Negative in an approved screening test	All doses	
Anti-HIV 1.2	Negative in an approved screening test	All doses	
Syphilis	Negative in screening test	All doses	
Volume	250 ± 50 ml	1 % of all doses	Department of preparation of blood and its components
Residual leucocytes **	$<1, 2 \times 10^9$ per dose	At least 4 doses per month	Department for quality control of blood products
Hemoglobin	At least 43 g / dose	At least 4 doses per month	
Hematocrit	0.65 - 0.75	At least 4 doses per month	
Hemolysis at the end of the storage period	No more than 0.8 % of red blood cells	4 doses per month	

Note: *- Parameter "control frequency", if it is different from the value "All doses", displays the minimum frequency of testing and indicates the necessity for statistical

control of the process to reduce the risk of deviations in the quality of the blood component.

** - The requirements are met if 90% of the tested doses fall within the range of the indicated values.

Storage and transportation

The erythrocyte mass with removed LTL shall be stored at a temperature from +2° C to +6°C. Shelf-life depends on the used anticoagulant or preservative solution, for example, when using CFDA-1, shelf-life is 35 days.

Transportation is carried out in a specialized thermal container that allows to keep the temperature no higher than +10°C for at least 24 hours of transportation.

Marking

Information is recorded on the label:

name of the organization-manufacturer;

unique identification number of the donation;

name of the blood component;

blood group according to ABO system and Rhesus affiliation Rh (D);

blood group phenotype (if necessary);

date of donation;

expiration date;

name of the anticoagulant;

note on additional processing (irradiance);

volume;

storage temperature;

information about pre-transfusion procedures;

information that the component is introduced through a filter with a pore size of 150-200 microns.

Precautionary measures

Prior to transfusion compatibility checking of the Erythrocyte mass with removed LTL with the blood of the recipient is carried out.

Adverse reactions

When transfusion the Erythrocyte mass with removed LTL there are risks of developing conditions:

hemolytic post- transfusion reaction;

non- hemolytic post-transfusion reaction (most often-chills, fever, urticaria);

anaphylaxis;

alloimmunization by erythrocyte and HLA antigens;

the syndrome of acute lung injury due to transfusion (SALI);

post-transfusion purpura;

“graft versus host” reaction;

sepsis, caused by accidental bacterial contamination;
 transmission of viral infection (hepatitis, HIV, and others) is not excluded, despite the careful selection of the donor and examination of the donor's blood by modern methods;
 risk of transmission of protozoal infection (malaria);
 transmission of other unidentified or non-mandatory screening pathogens;
 citrate intoxication in newborns and patients with impaired liver function;
 metabolic disorders in massive transfusions (hyperkalemia, other);
 iron overload;
 circulatory overload.

5. Erythrocyte mass leukofiltered

Definition

Erythrocyte mass leucofiltered is a component of blood obtained from the Blood whole, from Erythrocyte mass, or from Erythrocyte mass with removed LTL. The content of leucocytes in the component is less than 1×10^6 .

Preparation

Erythrocyte mass leucofiltered is obtained from the Blood whole by centrifugation and subsequent removal of plasma and filtration, from Erythrocyte mass or from Erythrocyte mass with removed LTL after filtration.

Leucocytes are removed by filtration within 48 hours after donation.

Using

Erythrocyte mass with removed LTL is used for transfusion without additional processing, or in presence of clinical indications, shall be subjected to ionizing irradiation for deprivation the lymphocytes viability to prevent "graft versus host" reaction in immunocompromised patients during intrauterine transfusions, during transfusion from relatives, and for any other groups of patients.

Quality criteria

Verification parameter	Quality requirements (specification)	Control frequency*	Who controls it
ABO, Rh (D)	Typing	All doses	Department of blood testing and laboratory researches
ALT	Not increased	All doses	
HBsAg	Negative in an approved screening test	All doses	
Anti-HCV	Negative in an approved screening test	All doses	
Anti-HIV 1.2	Negative in an approved screening test	All doses	
Syphilis	Negative in screening test	All doses	

Volume	It is determined depending on the used system	1 % of all doses	Department of preparation of blood and its components
Residual leucocytes**	<1x10 ⁶ in dose according to calculation	1 % of all doses, at least 10 doses per month	Department for quality control of blood products
Hemoglobin	At least 40 g/dose	1 % of all doses, at least 4 doses per month	
Hematocrit	0.65 – 0.75	4 doses per month	
Hemolysis at the end of the storage period	No more than 0.8 % of red blood cells	4 doses per month	

Note: *- Parameter "control frequency", if it is different from the value "All doses", displays the minimum frequency of testing and indicates the necessity for statistical control of the process to reduce the risk of deviations in the quality of the blood component.

** - The requirements are met if 90% of the tested doses fall within the range of the indicated values.

Storage and transportation

Erythrocyte mass leucofiltered shall be stored at a temperature from +2°C to +6°C. Shelf-life depends on the used anticoagulant or preservative solution, for example, when using CFDA-1, shelf-life is 35 days.

Transportation is carried out in a specialized thermal container that allows to keep the temperature no higher than +10°C for at least 24 hours of transportation.

Marking

Information is recorded on the label:

name of the organization-manufacturer;

unique identification number of the donation;

name of the blood component;

blood group according to ABO system and Rhesus affiliation Rh (D);

blood group phenotype (if necessary);

date of donation;

expiration date;

name of the anticoagulant;

note on additional processing (irradiance);

volume;

storage temperature;

information about pre-transfusion procedures;

information that the component is introduced through a filter with a pore size of 150-200 microns.

Precautionary measures

Prior to transfusion compatibility checking of the Erythrocyte mass leucofiltered with the blood of the recipient is carried out.

Adverse reactions

When transfusion the Erythrocyte mass leucofiltered there are risks of developing conditions:

hemolytic post- transfusion reaction;

non- hemolytic post-transfusion reaction (most often-chills, fever, urticaria);

anaphylaxis;

alloimmunization by erythrocyte and HLA antigens;

the syndrome of acute lung injury due to transfusion (SALI);

post-transfusion purpura;

“graft versus host” reaction;

sepsis, caused by accidental bacterial contamination;

transmission of viral infection (hepatitis, HIV, and others) is not excluded, despite the careful selection of the donor and examination of the donor's blood by modern methods;

risk of transmission of protozoal infection (malaria);

transmission of other unidentified or non-mandatory screening pathogens;

citrate intoxication in newborns and patients with impaired liver function;

metabolic disorders in massive transfusions (hyperkalemia, other);

iron overload;

circulatory overload.

6. Erythrocyte suspension

Definition

Erythrocyte suspension is a component of blood obtained from the Blood whole. It contains most of leucocytes of the whole blood ($2.5-3.0 \times 10^9$ cells) and a different number of platelets, which depends on the method of centrifugation.

Preparation

Erythrocyte suspension is obtained from the Blood whole by removing plasma after centrifugation, followed by immediate addition of an additive solution.

Using

Erythrocyte suspension is used for transfusion without additional processing, or in presence of clinical indications, shall be subjected to ionizing irradiation for deprivation the lymphocytes viability to prevent "graft versus host" reaction in immunocompromised patients during intrauterine transfusions, during transfusion from relatives, and for any other groups of patients.

If the Erythrocyte suspension is subjected to the procedure of pathogen inactivation, washing and re- resuspending in an additive solution, the resulting component shall be referred to as- erythrocytes virusinactivated, washed, resuspended in an additive solution.

Quality criteria

Verification parameter	Quality requirements (specification)	Control frequency*	Who controls it
ABO, Rh (D)	Typing	All doses	Department of blood testing and laboratory researches
ALT	Not increased	All doses	
HBsAg	Negative in an approved screening test	All doses	
Anti-HCV	Negative in an approved screening test	All doses	
Anti-HIV 1.2	Negative in an approved screening test	All doses	
Syphilis	Negative in screening test	All doses	
Volume	It is determined depending on the system used	All doses	Department of preparation of blood and its components
Hemoglobin	At least 45 g/dose	At least 4 doses per month	Department for quality control of blood products
Hematocrit	0.50 - 0.70	At least 4 doses per month	
Hemolysis at the end of the storage period	No more than 0.8 % of erythrocytes	4 doses per month	

Note: *- Parameter "control frequency", if it is different from the value "All doses", displays the minimum frequency of testing and indicates the necessity for statistical control of the process to reduce the risk of deviations in the quality of the blood component.

Storage and transportation

Erythrocyte suspension shall be stored at a temperature from +2°C to +6°C. Shelf-life depends on the type of anticoagulant/additive solution system and is extended to the limit set for this additive solution.

During transportation, the temperature not higher than +10°C is kept. Transport system ensuring the set temperature for 24 hours shall be used.

Marking

Information is recorded on the label:

name of the organization-manufacturer;

unique identification number of the donation;

name of the blood component;

blood group according to ABO system and Rhesus affiliation Rh (D);

blood group phenotype (if necessary);

date of donation;

expiration date;
name of the anticoagulant;
note on additional processing (irradiance);
volume;
storage temperature;
information about pre-transfusion procedures;
information that the component is introduced through a filter with a pore size of 150-200 microns.

Precautionary measures

Prior to transfusion compatibility checking of the Erythrocyte suspension with the blood of the recipient is carried out in accordance with the legislation of the Republic of Kazakhstan.

Adverse reactions

When transfusion the Erythrocyte suspension there are risks of developing conditions:

hemolytic post- transfusion reaction;
non- hemolytic post-transfusion reaction (most often-chills, fever, urticaria);
anaphylaxis;
alloimmunization by erythrocyte and HLA antigens;
the syndrome of acute lung injury due to transfusion (SALI);
post-transfusion purpura;
“graft versus host” reaction;
sepsis, caused by accidental bacterial contamination;
transmission of viral infection (hepatitis, HIV, and others) is not excluded, despite the careful selection of the donor and examination of the donor's blood by modern methods;
risk of transmission of protozoal infection (malaria);
transmission of other unidentified or non-mandatory screening pathogens;
citrate intoxication in newborns and patients with impaired liver function;
metabolic disorders in massive transfusions (hyperkalemia, other);
iron overload;
circulatory overload.

7. Erythrocyte suspension with removed leukothrombocyte layer

Definition

Erythrocyte suspension with removed leukothrombocyte layer (hereinafter-Erythrocyte suspension with removed LTL) - a component of blood

obtained from the Blood whole. The content of leucocytes in the component is less than $1,2 \times 10^9$.

Preparation

Erythrocyte suspension with removed LTL is obtained from the Blood whole by removing most of the plasma and 20-60 ml of LTL after centrifugation, followed by immediate addition of an additive solution.

Using

Erythrocyte suspension with removed LTL is used for transfusion without additional processing, or in presence of clinical indications, shall be subjected to ionizing irradiation for deprivation the lymphocytes viability to prevent "graft versus host" reaction in immunocompromised patients during intrauterine transfusions, during transfusion from relatives, and for any other groups of patients.

Quality criteria

Verification parameter	Quality requirements (specification)	Control frequency*	Who controls it
ABO, Rh (D)	Typing	All doses	Department of blood testing and laboratory researches
ALT	Not increased	All doses	
HBsAg	Negative in an approved screening test	All doses	
Anti-HCV	Negative in an approved screening test	All doses	
Anti-HIV 1.2	Negative in an approved screening test	All doses	
Syphilis	Negative in screening test	All doses	
Volume	It is determined depending on the system used	1 % of all doses	Department of preparation of blood and its components
Residual leukocytes**	$<1, 2 \times 10^9$ per dose	At least 4 doses per month	Department for quality control of blood products
Hemoglobin	At least 43 g/dose	At least 4 doses per month	
Hematocrit	0.50 - 0.70	At least 4 doses per month	
Hemolysis at the end of the storage period	No more than 0.8 % of erythrocytes	4 doses per month	

Note: *- Parameter "control frequency", if it is different from the value "All doses", displays the minimum frequency of testing and indicates the necessity for statistical control of the process to reduce the risk of deviations in the quality of the blood component.

** - The requirements are met if 90% of the tested doses fall within the range of the indicated values.

Storage and transportation

Erythrocyte suspension with removed LTL shall be stored at a temperature from +2 °C to +6°C. Shelf-life depends on the type of anticoagulant/additive solution system and is extended to the limit set for this additive solution.

During transportation, the temperature not higher than +10°C is kept. Transport system ensuring the set temperature for 24 hours shall be used.

Marking

Information is recorded on the label:

name of the organization-manufacturer;

unique identification number of the donation;

name of the blood component;

blood group according to ABO system and Rhesus affiliation Rh (D);

blood group phenotype (if necessary);

date of donation;

expiration date;

name of the anticoagulant;

note on additional processing (irradiance);

volume;

storage temperature;

information about pre-transfusion procedures;

information that the component is introduced through a filter with a pore size of 150-200 microns.

Precautionary measures

Prior to transfusion compatibility checking of the Erythrocyte suspension with removed LTL with the blood of the recipient is carried out in accordance with the legislation of the Republic of Kazakhstan.

Adverse reactions

When transfusion the Erythrocyte suspension with removed LTL there are risks of developing conditions:

hemolytic post- transfusion reaction;

non- hemolytic post-transfusion reaction (most often-chills, fever, urticaria);

anaphylaxis;

alloimmunization by erythrocyte and HLA antigens;

the syndrome of acute lung injury due to transfusion (SALI);

post-transfusion purpura;

“graft versus host” reaction;

sepsis, caused by accidental bacterial contamination;

transmission of viral infection (hepatitis, HIV, and others) is not excluded, despite the careful selection of the donor and examination of the donor's blood by modern methods;

risk of transmission of protozoal infection (malaria);
 transmission of other unidentified or non-mandatory screening pathogens;
 citrate intoxication in newborns and patients with impaired liver function;
 metabolic disorders in massive transfusions (hyperkalemia, other);
 iron overload;
 circulatory overload.

8. Erythrocyte suspension leucofiltered

Definition

Erythrocyte suspension leucofiltered - a component of blood obtained from the Blood whole, Erythrocyte suspension, or Erythrocyte suspension with removed LTL. The content of leucocytes in the component is less than $1,0 \times 10^6$.

Preparation

Erythrocyte suspension leukofiltered is obtained by removing leukocytes by filtration within 48 hours after donation from the dose of the Blood whole and removal of plasma after centrifugation followed by immediate addition of an additive solution; as well as by filtering leukocytes from Erythrocyte suspension or Erythrocyte suspension with removed LTL.

Using

Erythrocyte suspension leukofiltered is used for transfusion without additional processing, or in presence of clinical indications, shall be subjected to ionizing irradiation for deprivation the lymphocytes viability to prevent "graft versus host" reaction in immunocompromised patients during intrauterine transfusions, during transfusion from relatives, and for any other groups of patients.

Quality criteria

Verification parameter	Quality requirements (specification)	Control frequency*	Who controls it
ABO, Rh (D)	Typing	All doses	Department of blood testing and laboratory researches
ALT	Not increased	All doses	
HBsAg	Negative in an approved screening test	All doses	
Anti-HCV	Negative in an approved screening test	All doses	
Anti-HIV 1.2	Negative in an approved screening test	All doses	
Syphilis	Negative in screening test	All doses	Department of preparation of blood and its components
Volume	It is determined depending on the system used	1 % of all doses	
Residual leukocytes**	< 1×10^6 in the calculated dose	1 % of all doses, at least 4 doses per month	

Hemoglobin	At least 40 g/dose	1 % of all doses, at least 4 doses per month	Department for quality control of blood products
Hematocrit	0.50 - 0.70	4 doses per month	
Hemolysis at the end of the storage period	No more than 0.8 % of erythrocytes	4 doses per month	

Note: *- Parameter "control frequency", if it is different from the value "All doses", displays the minimum frequency of testing and indicates the necessity for statistical control of the process to reduce the risk of deviations in the quality of the blood component.

** - The requirements are met if 90% of the tested doses fall within the range of the indicated values.

Storage and transportation

Erythrocyte suspension leucofiltered shall be stored at a temperature from +2°C to +6°C. Shelf-life depends on the type of anticoagulant/additive solution system and is extended to the limit set for this additive solution.

During transportation, the temperature not higher than +10°C is kept. Transport system ensuring the set temperature for 24 hours shall be used.

Marking

Information is recorded on the label:

name of the organization-manufacturer;

unique identification number of the donation;

name of the blood component;

blood group according to ABO system and Rhesus affiliation Rh (D);

blood group phenotype (if necessary);

date of donation;

expiration date;

name of the anticoagulant;

note on additional processing (irradiance);

volume;

storage temperature;

information about pre-transfusion procedures;

information that the component is introduced through a filter with a pore size of 150-200 microns.

Precautionary measures

Prior to transfusion compatibility checking of the Erythrocyte suspension leucofiltered with the blood of the recipient is carried out in accordance with the legislation of the Republic of Kazakhstan.

Adverse reactions

When transfusion the Erythrocyte suspension leucofiltered there are risks of developing conditions:

hemolytic post- transfusion reaction;
 non- hemolytic post-transfusion reaction (most often-chills, fever, urticaria);
 anaphylaxis;
 alloimmunization by erythrocyte and HLA antigens;
 the syndrome of acute lung injury due to transfusion (SALI);
 post-transfusion purpura;
 “graft versus host” reaction;
 sepsis, caused by accidental bacterial contamination;
 transmission of viral infection (hepatitis, HIV, and others) is not excluded, despite
 the careful selection of the donor and examination of the donor's blood by modern
 methods;
 risk of transmission of protozoal infection (malaria);
 transmission of other unidentified or non-mandatory screening pathogens;
 citrate intoxication in newborns and patients with impaired liver function;
 metabolic disorders in massive transfusions (hyperkalemia, other);
 iron overload;
 circulatory overload.

9. Erythrocytes apheresis

Definition

Erythrocytes apheresis - a component of blood obtained from one donor. The content of leucocytes in the component is different.

Receiving

Erythrocytes apheresis are obtained by taking erythrocytes from one donor by automatic cells separation using an anticoagulant - citrate-containing solution. The plasma is returned to the donor. During one procedure, one or two doses of erythrocytes apheresis can be received.

Using

Erythrocytes apheresis are used for transfusion without additional processing or subjected to preliminary leukofiltration or introducing additive solution, in addition, if there are clinical indications, shall be subjected to ionizing irradiation for deprivation the lymphocytes viability to prevent "graft versus host" reaction in immunocompromised patients during intrauterine transfusions, during transfusion from relatives, and for any other groups of patients.

Quality criteria

Verification parameter	Quality requirements (specification)	Control frequency*	Who controls it
ABO, Rh (D)	Typing	All doses	
ALT	Not increased	All doses	

HBsAg	Negative in an approved screening test	All doses	Department of blood testing and laboratory researches
Anti-HCV	Negative in an approved screening test	All doses	
Anti-HIV 1.2	Negative in an approved screening test	All doses	
Syphilis	Negative in screening test	All doses	
Volume	It is determined depending on the system used	1 % of all doses	Department of preparation of blood and its components
Hemoglobin	At least 40 g/dose	at least 4 doses per month	Department for quality control of blood products
Hematocrit	0.65 – 0.75	at least 4 doses per month	
Hematocrit (when adding an additive solution)	0.50 – 0.70	at least 4 doses per month	
Residual leukocytes** (during leukofiltration)	<1x10 ⁶ in the calculated dose	1 % of all doses, at least 10 doses per month	
Hemolysis at the end of the storage period	No more than 0.8 % of erythrocytes	4 doses per month	

Note: *- Parameter "control frequency", if it is different from the value "All doses", displays the minimum frequency of testing and indicates the necessity for statistical control of the process to reduce the risk of deviations in the quality of the blood component.

** - The requirements are met if 90% of the tested doses fall within the range of the indicated values.

Storage and transportation

If a functionally closed system was used in preparation of Erythrocytes apheresis component, shelf-life corresponds to the anticoagulant used. In the case of preparation of erythrocytes in a functionally open system, shelf-life is limited to 24 hours, regardless of the additive solution.

When using an additive solution, shelf-life of Erythrocytes apheresis is extended to the limit set for the additive solution system. The storage temperature is from +2°C to +6°C.

During transportation, the temperature not higher than +10°C is kept. Transport system ensuring the set temperature for 24 hours shall be used.

Marking

Information is recorded on the label:

name of the organization-manufacturer;

unique identification number of the donation;

name of the blood component;

blood group according to ABO system and Rhesus affiliation Rh (D);

blood group phenotype (if necessary);

date of donation;

- expiration date;
- name of the anticoagulant;
- note on additional processing (irradiance);
- volume;
- storage temperature;
- information about prohibiting the use of the component when abnormal hemolysis or other deterioration of properties is detected;
- information about pre-transfusion procedures;
- information that the component is introduced through a filter with a pore size of 150-200 microns.

Precautionary measures

Prior to transfusion compatibility checking of the Erythrocytes apheresis with the blood of the recipient is carried out.

Adverse reactions

When transfusion the Erythrocyte apheresis there are risks of developing conditions :

- hemolytic post- transfusion reaction;
- non- hemolytic post-transfusion reaction (most often-chills, fever, urticaria);
- anaphylaxis;
- alloimmunization by erythrocyte and HLA antigens;
- the syndrome of acute lung injury due to transfusion (SALI);
- post-transfusion purpura;
- “graft versus host” reaction;
- sepsis, caused by accidental bacterial contamination;
- transmission of viral infection (hepatitis, HIV, and others) is not excluded, despite the careful selection of the donor and examination of the donor's blood by modern methods;
- risk of transmission of protozoal infection (malaria);
- transmission of other unidentified or non-mandatory screening pathogens;
- citrate intoxication in newborns and patients with impaired liver function;
- metabolic disorders in massive transfusions (hyperkalemia, other);
- iron overload;
- circulatory overload.

10. Erythrocytes washed

Definition

Erythrocytes washed - a component of blood obtained by recycling the erythrocyte mass or erythrocyte suspension and their variants. The amount of residual plasma

depends on the washing protocol. Hematocrit can be adjusted depending on the clinical need.

Preparation

Erythrocytes washed are obtained by successive washing (adding) of physiological solution, centrifugation, and removal of the supernatant. Most of the plasma, leukocytes, and platelets are removed. During centrifugation, the temperature is monitored.

Using

Erythrocytes washed are used for transfusion without additional processing or are subjected to leukofiltration or additional ionizing radiation, in the presence of clinical indications for deprivation the lymphocytes viability to prevent "graft versus host" reaction in immunocompromised patients during intrauterine transfusions, during transfusion from relatives, and for any other groups of patients.

Erythrocytes apheresis are used for transfusion without or preliminary leukofiltration or introducing additive solution, in addition, if there are clinical indications, shall be subjected to ionizing irradiation

Quality criteria

Verification parameter	Quality requirements (specification)	Control frequency*	Who controls it
ABO, Rh (D)	Typing	All doses	Department of blood testing and laboratory researches
ALT	Not increased	All doses	
HBsAg	Negative in an approved screening test	All doses	
Anti-HCV	Negative in an approved screening test	All doses	
Anti-HIV 1.2	Negative in an approved screening test	All doses	
Syphilis	Negative in screening test	All doses	
Volume	It is determined depending on the system used	1 % of all doses	Department of preparation of blood and its components
Hemoglobin	At least 40 g/dose	all doses	Department for quality control of blood products
Hematocrit	0.65 – 0.75	all doses	
Hematocrit (when adding an additive solution)	0.50 – 0.70	all doses	
Residual leukocytes** (during leukofiltration)	<1x10 ⁶ in the calculated dose	1 % of all doses, at least 4 doses per month	
Protein content in the final supernatant	< 0.5 per dose	All doses	
Hemolysis at the end of the process	No more than 0.8 % of erythrocytes	All doses	

Note: *- Parameter "control frequency", if it is different from the value "All doses", displays the minimum frequency of testing and indicates the necessity for statistical control of the process to reduce the risk of deviations in the quality of the blood component.

** - The requirements are met if 90% of the tested doses fall within the range of the indicated values.

Storage and transportation

If a functionally closed system was used in preparation of Erythrocytes washed component, shelf-life is 24 hours. In the case of preparation of erythrocytes in a functionally open system, shelf-life is limited to 24 hours.

When using an additive solution, shelf-life for such erythrocytes is extended in accordance with a validated procedure. The storage temperature is from +2°C to +6°C.

During transportation, the temperature not higher than +10°C is kept.

Marking

Information is recorded on the label:

name of the organization-manufacturer;

unique identification number of the donation;

name of the blood component;

blood group according to ABO system and Rhesus affiliation Rh (D);

blood group phenotype (if necessary);

date of donation;

preparation time of the component;

expiration date and time;

name of the anticoagulant;

name and volume of the washing solution;

note on additional processing (irradiance);

volume;

storage temperature;

information about prohibiting the use of the component when abnormal hemolysis or other deterioration of properties is detected;

information about pre-transfusion procedures;

information that the component is introduced through a filter with a pore size of 150-200 microns.

Precautionary measures

Prior to transfusion compatibility checking of the Erythrocytes washed with the blood of the recipient is carried out.

Adverse reactions

When transfusion the Erythrocytes washed there are risks of developing conditions:

hemolytic post- transfusion reaction;

- non- hemolytic post-transfusion reaction (most often-chills, fever, urticaria);
- anaphylaxis;
- alloimmunization by erythrocyte and HLA antigens;
- the syndrome of acute lung injury due to transfusion (SALI);
- post-transfusion purpura;
- “graft versus host” reaction;
- sepsis, caused by accidental bacterial contamination;
- transmission of viral infection (hepatitis, HIV, and others) is not excluded, despite the careful selection of the donor and examination of the donor's blood by modern methods;
- risk of transmission of protozoal infection (malaria);
- transmission of other unidentified or non-mandatory screening pathogens;
- citrate intoxication in newborns and patients with impaired liver function;
- metabolic disorders in massive transfusions (hyperkalemia, other);
- iron overload;
- circulatory overload.

11. Erythrocytes frozen and erythrocytes unfrozen recovered

Definition

Erythrocytes frozen – a component of blood obtained by recycling erythrocytes of a donor blood, by freezing.

Preparation

Erythrocytes frozen are obtained by freezing for seven days after procurement, with the addition of a cryoprotective solution. Two freezing methods are used for freezing:

- with a high concentration of glycerol;
- with a low concentration of glycerol.

Simultaneously with laying of frozen erythrocytes for storage, serum or plasma samples are laid to preserve the possibility of testing for newly discovered infectious markers in the future when the component is unfrozen.

Definition

Erythrocytes unfrozen recovered - a component of blood obtained from Erythrocytes frozen. The component contains a small amount of protein, leukocytes, and platelets.

Preparation

Erythrocytes unfrozen recovered are obtained from Erythrocytes frozen by washing (deglycerization).

Quality criteria

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Verification parameter	Quality requirements (specification)	Control frequency*	Who controls it
ABO, Rh (D)	Typing	All doses	Department of blood testing and laboratory researches
ALT	Not increased	All doses	
HBsAg	Negative in an approved screening test	All doses	
Anti-HCV	Negative in an approved screening test	All doses	
Anti-HIV 1.2	Negative in an approved screening test	All doses	
Syphilis	Negative in screening test	All doses	
Volume	> 185 ml	All doses	Department of preparation of blood and its components
Hemoglobin (supernatant)**	<0.2 g per dose	All doses	Department for quality control of blood products
Hemoglobin	minimum 36 g / dose	All doses	
Hematocrit	0.65 - 0.75	All doses	
Osmolarity***	< 340 mOsm/l	1% of all doses, at least 4 doses per month, if less than 4 doses per month each dose	
Residual leukocytes**	< 0, 1x10 ⁶ in the calculated dose	1% of all doses, at least 4 doses per month, if less than 4 doses per month each dose	
Sterility	Sterile	1% of all doses, at least 4 doses per month, if less than 4 doses per month each dose	

Note: *- Parameter "control frequency", if it is different from the value "All doses", displays the minimum frequency of testing and indicates the necessity for statistical control of the process to reduce the risk of deviations in the quality of the blood component.

** - The requirements are met if 90% of the tested doses fall within the range of the indicated values.

*** - Final suspension solution

Storage and transportation

The shelf-life of Erythrocytes frozen with a guarantee of preservation the set temperature is extended to 10 years.

The following modes of storage of Erythrocytes frozen are used:

when using the cryopreservation method with a high concentration of glycerol, the storage temperature is from -60°C to -80°C in an electric refrigerator;

when using the cryopreservation method with a low concentration of glycerol, the storage temperature is from -140°C to -150°C in liquid nitrogen vapor

Transportation of Erythrocytes frozen is carried out when the specified storage conditions are maintained.

The shelf-life of Erythrocytes unfrozen recovered is strictly limited to 24 hours from the moment of washing.

Erythrocytes unfrozen recovered are stored at a temperature from $+2^{\circ}\text{C}$ to $+6^{\circ}\text{C}$.

During transportation of Erythrocytes unfrozen recovered, the temperature not higher than $+10^{\circ}\text{C}$ is kept. Transport system ensuring the set temperature for 24 hours shall be used.

Marking

On the label of Erythrocytes frozen information is recorded:

name of the organization-manufacturer;

unique identification number of the donation;

date of donation;

expiration date;

name of the anticoagulant;

the name and volume of the cryoprotective solution;

additional information about the component (if necessary);

volume;

storage temperature;

On the label of Erythrocytes unfrozen recovered information is recorded:

name of the organization-manufacturer;

unique identification number of the donation;

name of the blood component;

blood group according to ABO system and Rhesus affiliation Rh (D);

blood group phenotype (if necessary);

date of donation;

expiration date;

name of the anticoagulant;

name and volume of the additive solution;

additional information about the component (if necessary);

volume;

storage temperature;

information about prohibiting the use of the component when abnormal hemolysis or other deterioration of properties is detected;

information about pre-transfusion procedures;

information that the component is introduced through a filter with a pore size of 150-200 microns.

Precautionary measures

Prior to transfusion compatibility checking of the Erythrocytes unfrozen recovered with the blood of the recipient is carried out.

Adverse reactions

When transfusion the Erythrocytes unfrozen recovered there are risks of developing conditions:

hemolytic post- transfusion reaction;

anaphylaxis;

risk of alloimmunization by erythrocyte and HLA antigens;

sepsis, caused by accidental bacterial contamination;

transmission of viral infection (hepatitis, HIV, and others) is not excluded, despite the careful selection of the donor and examination of the donor's blood by modern methods;

risk of transmission of protozoal infection (malaria);

transmission of other unidentified or non-mandatory screening pathogens;

iron overload;

circulatory overload.

12. Fresh frozen plasma

Definition

Fresh frozen plasma (hereinafter - FFP) - a component of blood obtained from a dose of the Blood whole or by plasmapheresis method.

Preparation

FFP is obtained by freezing plasma under conditions that preserve labile clotting factors - within the first 6 hours after preparation, but no later than 18 hours if the dose was cooled immediately after preparation. If the plasma dose was cooled using special validated equipment to a temperature between + 20°C and + 24°C, shelf-life before freezing is extended to 24 hours. Freezing is carried out in a system that provides a temperature of -30°C for 1 hour.

Before freezing, the plasma is subjected to leucofiltration, while the content of leukocytes is less than 1×10^6 . FFP can be quarantined to eliminate the risk associated with the "window period", while the FFP is recognized as quarantined after repeated examination of the donor for infection markers - surface antigen for hepatitis B, anti - HIV and anti - HCV 6 months after blood donation. When using the polymerase chain reaction method for diagnostics, the quarantine period is reduced to 4 months.

Compliance of FFP and its varieties used as Human plasma for fractionation with the specifications set out in the articles of the Pharmacopoeia is ensured.

Compliance of FFP for clinical use with the requirements of this section is ensured.

Using

FFP for clinical use is defrosted before use at a temperature from + 34°C to +37°C in specialized devices.

Quality criteria

Verification parameter	Quality requirements (specification)	Control frequency*	Who controls it
ABO, Rh (D)	Typing	All doses	Department of blood testing and laboratory researches
ALT	Not increased	All doses	
HBsAg	Negative in an approved screening test	All doses	
Anti-HCV	Negative in an approved screening test	All doses	
Anti-HIV 1.2	Negative in an approved screening test	All doses	
Syphilis	Negative in screening test	All doses	
Volume	Set volume \pm 10%	All doses	Department of preparation of blood and its components
Container's Integrity	There should be no leakage in any part of the container (visual inspection after the plasma extractor pressure before freezing and after defrosting)	All doses	
Visual changes	There should be no abnormal color or visible clots	All doses	
Factor VIII	On average (after freezing and defrosting) at least 70% of the initial level in the dose.	Once a quarter in a pool of 10 plasma doses twice-before freezing and at the end of the first month of storage	Department for quality control of blood products
Residual cells**	Erythrocytes -no more than $6.0 \times 10^9/l$ Leukocytes - no more than $0.1 \times 10^9/l$; Platelets – no more than $50 \times 10^9/l$.	1 % of all doses, at least 4 doses per month	
	When depleted by leukocytes less than 1×10^6	1 % of all doses, at least 10 doses per month	

Note: *- Parameter "control frequency", if it is different from the value "All doses", displays the minimum frequency of testing and indicates the necessity for statistical control of the process to reduce the risk of deviations in the quality of the blood component.

** Cells counting is carried out before freezing, if the study was not performed when monitoring the quality of the blood whole, from which the plasma was obtained. It is possible to reduce the threshold values when cell elimination procedures are included in the Protocol. If fresh frozen plasma is regularly used as a raw material for obtaining a component other than Factor VIIIc, appropriate calculations are performed on typical samples of units to ensure the effectiveness of the preparatory procedure. The requirements are met if 90% of the tested doses fall within the range of the specified values.

Storage and transportation

Storage of FFP in frozen form is carried out:

for 36 months if the storage temperature is below -25°C ;

for 3 months at a storage temperature of -18°C to -25°C ;

The storage temperature is maintained during transportation of FFP in the frozen state.

After defrosting, FFP is used as quickly as possible, but no later than within 1 hour.

After defrosting for clinical use, FFP is not subject to repeated freezing.

Marking

Information is recorded on the label:

name of the organization-manufacturer;

unique identification number of the donation;

name of the blood component;

blood group according to ABO system;

date of donation;

expiration date;

name of the anticoagulant;

note on additional processing (irradiance, quarantine, leukofiltration);

volume;

storage temperature;

information that the component is introduced through a filter with a pore size of 150-200 microns.

Precautionary measures

Prior to transfusion compatibility checking of the Erythrocytes unfrozen recovered with the blood of the recipient is carried out.

FFP is not used for the patients with protein intolerance.

Adverse reactions

When transfusion the FFP there are risks of developing conditions:

hemolytic posttransfusion reaction in case of blood group mismatch in the ABO system;

non- hemolytic posttransfusion reaction (most often-chills, fever, urticaria);

the syndrome of acute lung injury due to transfusion (SALI);

sepsis, caused by accidental bacterial contamination;

transmission of viral infection (hepatitis, HIV, and others) is not excluded, despite the careful selection of the donor and examination of the donor's blood by modern methods;

risk of transmission of protozoal infection (malaria);

transmission of other unidentified or non-mandatory screening pathogens;

citrate intoxication in newborns and patients with impaired liver function;

circulatory overload;

anaphylaxis and allergic reactions

13. Fresh-frozen plasma virus-inactivated

Definition

Fresh-frozen virus-inactivated plasma (hereinafter- FFP virus-inactivated) - a component of blood obtained from the Blood whole, or by apheresis method, subjected to virus inactivation and frozen. SPP virus-inactivated contains an average of 50 to 70% of labile clotting factors and natural inhibitors, which reduces the risk of infection with hepatitis B, C, and HIV 1.2 shell viruses by an average of a thousand times.

Preparation

FFP virus-activated is obtained by inactivating viruses in plasma, which is performed before freezing or after defrosting the plasma. The pathogen inactivation procedure is carried out using methylene blue, amotosalene and riboflavin or other methods allowed for use in the Republic of Kazakhstan and is performed in accordance with the instructions of the equipment manufacturer, the freezing conditions are observed as for FFP.

FFP virus-inactivated is additionally subjected to leukofiltration.

Compliance of FFP virus-inactivated for clinical use with the requirements of this section is ensured.

Using

FFP virus-inactivated for clinical use is subjected to defrosting at a temperature of + 34°C+37°C in specialized devices before using.

Quality criteria

Verification parameter	Quality requirements (specification)	Control frequency*	Who controls it
ABO, Rh (D)	Typing	All doses	Department of blood testing and laboratory researches
ALT	Not increased	All doses	
HBsAg	Negative in an approved screening test	All doses	
Anti-HCV	Negative in an approved screening test	All doses	
Anti-HIV 1.2	Negative in an approved screening test	All doses	
Syphilis	Negative in screening test	All doses	
Volume	Set volume ± 10%	All doses	Department of preparation of blood and its components
Container's Integrity	There should be no leakage in any part of the container (visual inspection after the plasma extractor pressure before freezing and after defrosting)	All doses	
Visual changes	There should be no abnormal color or visible clots	All doses	

Factor VIII	On average (after freezing and defrosting) at least 70% of the initial level in the dose.	Once a quarter in a pool of 10 plasma doses twice-before freezing and at the end of the first month of storage	Department for quality control of blood products
Fibrinogen	On average (after freezing and defrosting) \geq 60% of the activity of the freshly collected plasma dose.	Once a quarter in a pool of 10 plasma doses twice-before freezing and at the end of the first month of storage	
Residual cells**	Erythrocytes -no more than $6.0 \times 10^9/l$ Leukocytes - no more than $0.1 \times 10^9/l$; Platelets – no more than $50 \times 10^9/l$.	1 % of all doses, at least 10 doses per month	
	When depleted by leukocytes less than 1×10^6	1 % of all doses, at least 10 doses per month	

Note: *- Parameter "control frequency", if it is different from the value "All doses", displays the minimum frequency of testing and indicates the necessity for statistical control of the process to reduce the risk of deviations in the quality of the blood component.

** Cells counting is carried out before freezing, if the study was not performed when monitoring the quality of the blood whole, from which the plasma was obtained. It is possible to reduce the threshold values when cell elimination procedures are included in the Protocol. If fresh frozen plasma is regularly used as a raw material for obtaining a component other than Factor VIIIc, appropriate calculations are performed on typical samples of units to ensure the effectiveness of the preparatory procedure. The requirements are met if 90% of the tested doses fall within the range of the specified values.

Storage and transportation

Storage of FFP virus- inactivated in frozen form is carried out:

for 36 months if the storage temperature is below -25°C ;

for 3 months at a storage temperature of -18°C to -25°C ;

The storage temperature is maintained during transportation of FFP virus-inactivated in the frozen state.

After defrosting, FFP virus-inactivated is used as quickly as possible, but no later than within 1 hour.

After defrosting for clinical use, FFP virus-inactivated is not subject to repeated freezing.

Marking

Information is recorded on the label:

name of the organization-manufacturer;

unique identification number of the donation;

if two or more doses of the components are received for one donation, each dose is assigned a unique identification number;

name of the blood component;

blood group according to ABO system;
date of donation;
expiration date;
name of the anticoagulant;
name of the compound used for pathogen inactivation;
note on additional processing (irradiance, quarantine, leukofiltration);
volume;
storage temperature;
information that the component is introduced through a filter with a pore size of 150-200 microns.

Precautionary measures

FFP virus-inactivated is not used for:
the patients with protein intolerance;
the newborns undergoing phototherapy, if the inactivation of pathogens was carried out using amotosalen;
the patients with deficiency of G-6-PD, if the inactivation of pathogens was carried out using methylene blue;
the patients with an established allergy to compounds used for inactivation of pathogens or resulting from it;

Adverse reactions

When transfusion the FFP virus-inactivated there are risks of developing conditions :

- hemolytic posttransfusion reaction in case of blood group mismatch in the ABO system;
- non-hemolytic posttransfusion reaction (most often-chills, fever, urticaria);
- the syndrome of acute lung injury due to transfusion (SALI);
- sepsis, caused by accidental bacterial contamination;
- transmission of viral infection (hepatitis B and C, HIV) is unlikely, and transmission of other pathogens that are not recognized or not included in mandatory screening or are not sensitive to the inactivation procedure is possible;
- risk of transmission of protozoal infection (malaria);
- citrate intoxication in newborns and patients with impaired liver function;
- circulatory overload;
- anaphylaxis and allergic reactions to compounds used for inactivation of pathogens or resulting from it.

14. Cryoprecipitate

Definition

Cryoprecipitate- a component of blood containing the cryoglobulin fraction of plasma, Cryoprecipitate contains most of Factor VIII, Willebrand factor, fibrinogen, Factor XIII and fibronectin.

Preparation

Cryoprecipitate is obtained by further processing of freshly collected and separated plasma or FFP and subjected to concentration.

FFP is subjected to thawing at a temperature from +2°C to +6°C, or by rapid siphon defrosting method, centrifuged in a hard mode at a constant temperature, the supernatant plasma is removed, and the precipitate is quickly frozen.

When receiving the component, it is possible to remove leucocytes from the source material, its viral inactivation or its quarantine.

Using

Cryoprecipitate for clinical use is subjected to defrosting at a temperature of +37°C in specialized devices before use.

Quality criteria

Verification parameter	Quality requirements (specification)	Control frequency*	Who controls it
ABO, Rh (D)	Typing	All doses	Department of blood testing and laboratory researches
ALT	Not increased	All doses	
HBsAg	Negative in an approved screening test	All doses	
Anti-HCV	Negative in an approved screening test	All doses	
Anti-HIV 1.2	Negative in an approved screening test	All doses	
Syphilis	Negative in screening test	All doses	
Volume**	20-40 мл	All doses	
Container's integrity	There should be no leakage in any part of the container (visual inspection after the plasma extractor pressure before freezing and after defrosting)	All doses	Department of preparation of blood and its components
Visual changes	There should be no abnormal color or visible clots	All doses	
Factor VIII	≥ 70 ME per dose	Every two months A) Pool of six doses of different blood groups during the first month of storage. B) Pool of six doses of different blood groups during the last month of storage.	Department for quality control of blood products
Fibrinogen	≥ 140 mg per dose	1 % of all doses, at least 4 doses per month	

Note: *- Parameter "control frequency", if it is different from the value "All doses", displays the minimum frequency of testing and indicates the necessity for statistical control of the process to reduce the risk of deviations in the quality of the blood component.

** When receiving cryoprecipitate from FFP from a single dose of whole blood. When using apheresis FFP, the volume differs.

Storage and transportation

Storage of Cryoprecipitate in frozen form is carried out:

for 36 months if the storage temperature is below -25°C ;

for 3 months at a storage temperature of -18°C to -25°C ;

When transporting Cryoprecipitate in a frozen state, the storage temperature is maintained.

After defrosting, the Cryoprecipitate is used as soon as possible, but no later than within 1 hour.

After defrosting of the Cryoprecipitate repeated freezing is not carried out.

Marking

Information is recorded on the label:

name of the organization-manufacturer;

unique identification number of the donation, if two or more doses of the components are received for one donation, each dose is assigned a unique identification number;

name of the blood component;

blood group according to ABO system;

date of preparation;

expiration date;

note on additional processing (irradiance, quarantine, leukofiltration);

volume;

storage temperature;

information that the component is introduced through a filter with a pore size of 150-200 microns.

Precautionary measures

Cryoprecipitate is not used in patients with plasma protein intolerance.

Adverse reactions

There are risks of developing conditions during Cryoprecipitate transfusion:

non-hemolytic posttransfusion reaction (most often-chills, fever, urticaria);

the syndrome of acute lung injury due to transfusion (SALI);

development of Factor VIII inhibitors in patients with hemophilia;

sepsis caused by accidental bacterial contamination;

transmission of a viral infection (hepatitis B and C, HIV) is not excluded, despite the careful selection procedure of the donor and examination of the donor's blood by modern methods;

transmission of other pathogens unidentified or not included in the mandatory screening of pathogens is possible;

risk of transmission of protozoal infection (malaria);

citrate intoxication in newborns and patients with impaired liver function.

15. Plasma supernatant

Definition

Plasma supernatant-a component of blood obtained during plasma recycling, contains the amount of albumin, immunoglobulins, clotting factors the same as in FFP, and the number of labile Factors V and VIII and fibrinogen is reduced.

Receiving

Plasma supernatant - a by-product obtained from the FFP by removing cryoprecipitate.

When receiving the component, removing of leucocytes from the source material, its virus inactivation or its quarantine is performed.

Using

Plasma supernatant for clinical use is defrosted at a temperature of + 34°C+37°C in specialized devices before use.

Quality criteria

Verification parameter	Quality requirements (specification)	Control frequency *	Who controls it
ABO, Rh (D)	Typing	All doses	Department of blood testing and laboratory researches
ALT	Not increased	All doses	
HBsAg	Negative in an approved screening test	All doses	
Anti-HCV	Negative in an approved screening test	All doses	
Anti-HIV 1.2	Negative in an approved screening test	All doses	
Syphilis	Negative in screening test	All doses	
Volume	Set volume \pm 10%	All doses	Department of preparation of blood and its components
Container's integrity	There should be no leakage in any part of the container (visual inspection after the plasma extractor pressure before freezing and after defrosting)	All doses	
Visual changes	There should be no abnormal color or visible clots	All doses	

Note: *- Parameter "control frequency", if it is different from the value "All doses", displays the minimum frequency of testing and indicates the necessity for statistical

control of the process to reduce the risk of deviations in the quality of the blood component.

Storage and transportation

Storage of Plasma supernatant in frozen form is carried out:
for 36 months if the storage temperature is below -25°C ;
for 3 months at a storage temperature of -18°C to -25°C ;

When transporting the supernatant Plasma in the frozen state, the storage temperature is maintained.

After defrosting, the Plasma supernatant is used as quickly as possible, but no later than within 1 hour.

After defrosting for clinical use, the Plasma supernatant is not subjected to repeated freezing.

Marking

Information is recorded on the label:

name of the organization-manufacturer;

unique identification number of the donation, if two or more doses of the components are received for one donation, each dose is assigned a unique identification number;

name of the blood component;

blood group according to ABO system;

date of preparation;

expiration date;

name of the anticoagulant;

note on additional processing (irradiance, quarantine, leukofiltration);

volume;

storage temperature;

information that the component is introduced through a filter with a pore size of 150-200 microns.

Precautionary measures

Plasma supernatant is not used in patients with protein intolerance.

Adverse reactions

There are risks of developing conditions during transfusion of the Plasma supernatant:

hemolytic posttransfusion reaction in case of blood group mismatch in the ABO system;

non-hemolytic posttransfusion reaction (most often-chills, fever, urticaria);

the syndrome of acute lung injury due to transfusion (SALI);

sepsis caused by accidental bacterial contamination;

transmission of viral infection (hepatitis, HIV, and others) is not excluded, despite the careful selection of the donor and examination of the donor's blood by modern methods;

risk of transmission of protozoal infection (malaria);

transmission of other unidentified or non-mandatory screening pathogens;

citrate intoxication in newborns and patients with impaired liver function;

circulatory overload;

anaphylaxis and allergic reactions.

16. Platelet concentrate recovered from a blood dose

Definition

Platelet concentrate recovered from a blood dose - a blood component obtained from the Blood whole dose. It contains most of the original whole blood platelets suspended in plasma and contains more than 60×10^9 platelet cells.

Preparation

Platelet concentrate recovered from a blood dose is prepared using one of the following methods:

from platelet-rich plasma (PRP), it contains up to $0,2 \times 10^9$ leukocytes,

from the leukotrombocyte layer (LTL), it contains up to $0,05 \times 10^9$ leukocytes.

Using

Platelet concentrate recovered from a blood dose is used for transfusions to children and newborns. To reach the standard adult dose, 4 to 6 doses of Platelet concentrate, recovered from the blood dose, are required.

Quality criteria

Verification parameter	Quality requirements (Control frequency*)	Who controls it
ABO, Rh (D)	Typing	Department of blood testing and laboratory researches
ALT	Not increased	
HBsAg	Negative in an approved screening test	
Anti-HCV	Negative in an approved screening test	
Anti-HIV 1.2	Negative in an approved screening test	
Syphilis	Negative in screening test	

Volume	>40 ml per 60x10 ⁹ platelets	All doses	Department of preparation of blood and its components
Content of platelets in the final dose**	>60x10 ⁹	1 % of all doses, at least 10 doses per month	Department for quality control of blood products
Residual leukocytes*** A) from the LTL B) from PRP	<0,05x10 ⁹ <0,2x10 ⁹	1 % of all doses, at least 10 doses per month	
pH (at +22°C) measured at the end of the recommended shelf life****	>6,4	1 % of all doses, at least 4 doses per month	

Note:

*- Parameter "control frequency", if it is different from the value "All doses", displays the minimum frequency of testing and indicates the necessity for statistical control of the process to reduce the risk of deviations in the quality of the blood component.

** The requirements are met if 75% of the tested doses fall within the specified range.

*** The requirements are met if 90% of the tested doses fall within the specified range.

**** Measurement of pH is carried out in a closed system to avoid the release of CO₂. The measurement is performed at any temperature and the value is recalculated for the pH at +22°C.

Storage and transportation

Storage of Platelet concentrate recovered from a blood dose is carried out with continuous stirring at a temperature of + 20°C+24°C, the maximum storage period is 5 days, but under special conditions can be extended to 7 days.

When transporting Platelet concentrate recovered from a blood dose, the temperature is maintained as close as possible to the storage temperature.

Marking

Information is recorded on the label:

name of the organization manufacturer;

unique identification number of the donation during pooling and tracking of all donations numbers included in the pool is ensured.

name of the blood component;

blood group according to ABO system and Rhesus affiliation Rh(D);

date of donation;

expiration date;

name of the anticoagulant;

note on additional processing (irradiance, quarantine, leukofiltration);

volume;
the number of platelets (average, if the method of obtaining is validated, or real)
storage temperature;
information that the component is introduced through a filter with a pore size of 150-200 microns.

Precautionary measures

Platelet concentrate recovered from a blood dose is not used in patients with plasma protein intolerance.

Adverse reactions:

When transfusion of Platelet concentrate recovered from a blood dose, there are risks of developing conditions:

hemolytic posttransfusion reaction in case of blood group mismatch in the ABO system;

non-hemolytic posttransfusion reaction (most often-chills, fever, urticaria);

anaphylaxis;

alloimmunization by erythrocytes and HLA antigens;

post-transfusion purpura;

“graft versus host” reaction;

the syndrome of acute lung injury due to transfusion (SALI);

sepsis, caused by accidental bacterial contamination;

transmission of viral infection (hepatitis, HIV, and others) is not excluded, despite the careful selection of the donor and examination of the donor's blood by modern methods;

risk of transmission of protozoal infection (malaria);

transmission of other unidentified or non-mandatory screening pathogens;

citrate intoxication in newborns and patients with impaired liver function;

circulatory overload.

17. Platelet concentrate, recovered, pooled

Definition

Platelet concentrate, recovered, pooled- a component of blood obtained by combining 4-6 doses of thromboconcentrates, contains most of the platelets suspended in plasma. The minimum content of platelets in the component 2×10^{11} .

Preparation

Platelet concentrate, recovered, pooled is obtained from the leukotrombocyte layers of whole blood or by recycling and pooling 4-6 doses of Platelet concentrate recovered from a dose of blood.

Other varieties of the component are obtained by preparing on the basis of Platelet concentrate recovered, pooled component after additional processing - leucofiltration, virus inactivation, using an additive solution or using a combination of these methods:

Platelet concentrate, recovered, pooled, leucofiltered, prepared from 4-6 doses of whole fresh blood and subjected to leucofiltration;

Platelet concentrate, recovered, pooled, in an additive solution-contains a therapeutic dose of suspended platelets in a mixture of plasma (30-40%) and an additive solution (60-70%);

Platelet concentrate recovered, pooled, virus inactivated;

Platelet concentrate, recovered, pooled, leucofiltered, in an additive solution, the number of residual leucocytes in this case corresponds to the standard as when using leucofiltration;

Platelet concentrate recovered, pooled, leukofiltered, virus inactivated.

Using

Platelet concentrate, recovered, pooled and its varieties are used for clinical practice in adults and children.

Quality criteria

Verification parameter	Quality requirements (Control frequency* specification)	Who controls it
ABO, Rh (D)	Typing	All doses
ALT	Not increased	All doses
HBsAg	Negative in an approved screening test	All doses
Anti-HCV	Negative in an approved screening test	All doses
Anti-HIV 1.2	Negative in an approved screening test	All doses
Syphilis	Negative in screening test	All doses
Volume	>40 ml per 60x10 ⁹ platelets	All doses
Platelets content in the final dose**	Minimum 2x10 ¹¹	1 % of all doses, at least 10 doses per month
Residual leukocytes***	< 1x10 ⁹ per final dose	1 % of all doses, at least 10 doses per month

R e s i d u a l leukocytes *** in the leucofiltered component	1x10 ⁶ per final dose	1 % of all doses, at least 10 doses per month	Department for quality control of blood products
R e s i d u a l leukocytes *** in a component with an additive solution	0, 3x10 ⁹ per dose	1 % of all doses, at least 10 doses per month	
pH (at +22°C)measured at the end of the recommended shelf life****	>6.4	1 % of all doses, at least 10 doses per month	

Note: *- Parameter "control frequency", if it is different from the value "All doses", displays the minimum frequency of testing and indicates the necessity for statistical control of the process to reduce the risk of deviations in the quality of the blood component.

** The requirements are met if 75% of the tested doses fall within the specified range.

*** The requirements are met if 90% of the tested doses fall within the specified range.

**** Measurement of pH is carried out in a closed system to avoid the release of CO₂. The measurement is performed at any temperature and the value is recalculated for the pH at +22°C.

Storage and transportation

Storage of the component Platelet concentrate, recovered, pooled and its varieties is carried out under continuous stirring at a temperature of + 20°C+24°C, the maximum storage period is 5 days, the period can be extended to 7 days. If an open system was used for preparation of platelet concentrate (PC) recovered, pooled and its varieties, shelf-life does not exceed six hours.

When transporting Platelet concentrate, recovered, pooled and its varieties, the temperature is maintained as close as possible to the storage temperature.

Marking

Information is recorded on the label:

name of the organization- manufacturer;

unique identification number of the donation during pooling which allows you to track all the numbers included in the pool.

name of the blood component;

blood group according to ABO system and Rhesus affiliation Rh(D);

date of donation;

expiration date;

name of the anticoagulant;

note on additional processing (irradiance, quarantine, leukofiltration);

volume;

the number of platelets (average, if the method of obtaining is validated, or real)

storage temperature;
information that the component is introduced through a filter with a pore size of 150-200 microns.

Precautionary measures

Platelet concentrate recovered, pooled and its varieties are not used in patients with plasma protein intolerance.

Adverse reactions:

When transfusion of platelet concentrate recovered, pooled and its varieties, there are risks of developing conditions:

hemolytic posttransfusion reaction in case of blood group mismatch in the ABO system;

non-hemolytic posttransfusion reaction (most often-chills, fever, urticaria);

anaphylaxis;

alloimmunization by erythrocytes and HLA antigens;

alloimmunization by HPA antigens;

post-transfusion purpura;

“graft versus host” reaction;

the syndrome of acute lung injury due to transfusion (SALI);

sepsis, caused by accidental bacterial contamination;

transmission of viral infection (hepatitis, HIV, and others) is not excluded, despite the careful selection of the donor and examination of the donor's blood by modern methods;

risk of transmission of protozoal infection (malaria);

transmission of other unidentified or non-mandatory screening pathogens;

citrate intoxication in newborns and patients with impaired liver function;

circulatory overload.

18. Platelet concentrate apheresis

Definition

Platelet concentrate apheresis— a component of blood obtained from one donor by apheresis method, contains a therapeutic dose of platelets suspended in plasma.

Receiving

The method of receiving - platelet apheresis using equipment for automatic cells separation, anticoagulated with citrate-containing solution.

Other types of components are obtained on the basis of apheresis platelet concentrate, after their additional processing- leucofiltration, virus inactivation, with addition of an additive solution or using a combination of methods:

Platelet concentrate apheresis leukofiltered;

Platelet concentrate apheresis, in an additive solution;

Platelet concentrate apheresis virus inactivated

Platelet concentrate apheresis leucofiltered, in an additive solution-contains a therapeutic dose of suspended Platelets in a mixture of plasma (30-40%) and an additive solution (60-70%);

Platelet concentrate apheresis leucofiltered, virus inactivated;

Platelet concentrate apheresis leucofiltered, virus inactivated, in an additive solution.

Using

Platelet concentrate apheresis and its varieties are used for clinical practice in adults and children.

For transfusion to newborns, the component is divided into several approximately equal satellite containers, subject to sterility conditions.

Quality criteria

Verification parameter	Quality requirements (specification)	Control frequency*	Who controls it
ABO, Rh (D)	Typing	All doses	Department of blood testing and laboratory researches
ALT	Not increased	All doses	
HBsAg	Negative in an approved screening test	All doses	
Anti-HCV	Negative in an approved screening test	All doses	
Anti-HIV 1.2	Negative in an approved screening test	All doses	
Syphilis	Negative in screening test	All doses	
Volume	>40 ml per 60x10 ⁹ platelets	All doses	Department of preparation of blood and its components
The content of platelets**	The standard dose is at least 2x10 ¹¹ . For transfusion to newborns and young children a minimum of 0.5 x10 ¹¹ per dose	1 % of all doses, at least 10 doses per month	Department for quality control of blood products
Residual leukocytes***	< 0, 3 x 10 ⁹ per dose	1 % of all doses, at least 10 doses per month	
pH (at +22°C)measured at the end of the recommended shelf life*** *	> 6 . 4	1 % of all doses, at least 4 doses per month	
Residual leukocytes *** in the leucofiltered component	<1x10 ⁶ per final dose	1 % of all doses, at least 10 doses per month	
Residual leukocytes *** in a component with an additive solution	<0, 3 x 10 ⁹ per dose	1 % of all doses, at least 10 doses per month	

Note: *- Parameter "control frequency", if it is different from the value "All doses", displays the minimum frequency of testing and indicates the necessity for statistical

control of the process to reduce the risk of deviations in the quality of the blood component.

** The requirements are met if 75% of the tested doses fall within the specified range.

*** The requirements are met if 90% of the tested doses fall within the specified range.

**** Measurement of pH is carried out in a closed system to avoid the release of CO₂. The measurement can be performed at any temperature and the value is recalculated for the pH at +22°C.

Storage and transportation

Storage of apheresis Platelet concentrate and components prepared on its basis is carried out under continuous stirring at a temperature of + 20°C+24°C, the maximum storage period is five days, the period can be extended to seven days. If required, storage of apheresis platelet concentrate and components prepared on its basis is carried out for more than six hours. When preparing, a functionally closed system is used.

When transporting Platelet concentrate apheresis and components prepared on its basis, the temperature is maintained as close as possible to the storage temperature.

Marking

Information is recorded on the label:

name of the organization- manufacturer;

unique identification number of the donation;

name of the blood component;

blood group according to ABO system and Rhesus affiliation Rh(D);

date of donation;

expiration date;

name of the anticoagulant;

note on additional processing (irradiance, leukofiltration);

volume;

number of platelets (average, if the method of obtaining is validated or real)

storage temperature;

information that the component is introduced through a filter with a pore size of 150-200 microns.

Precautionary measures

Platelet concentrate apheresis and components prepared on its basis are not recommended for use in patients with intolerance to plasma proteins.

Adverse reactions

When transfusion of platelet concentrate apheresis and components prepared on its basis there are risks of developing conditions:

hemolytic posttransfusion reaction in case of blood group mismatch in the ABO system;

non-hemolytic posttransfusion reaction (most often-chills, fever, urticaria);
anaphylaxis;

alloimmunization by erythrocytes and HLA antigens;

alloimmunization by HPA antigens;

post-transfusion purpura;

“graft versus host” reaction;

the syndrome of acute lung injury due to transfusion (SALI);

sepsis, caused by accidental bacterial contamination;

transmission of viral infection (hepatitis, HIV, and others) is not excluded, despite the careful selection of the donor and examination of the donor's blood by modern methods; it does not apply to the components that have undergone virus inactivation, for which this is unlikely;

risk of transmission of protozoal infection (malaria);

transmission of other unidentified or non-mandatory screening pathogens;

citrate intoxication in newborns and patients with impaired liver function;

circulatory overload.

19. Platelet concentrate cryopreserved and Platelet concentrate cryopreserved recovered

Definition

Platelet concentrate cryopreserved– blood component obtained from Platelet concentrate apheresis, leucofiltered, contains more than 40% of the original component

Preparation

Platelet concentrate cryopreserved is obtained by recycling Platelet concentrate apheresis, leucofiltered by freezing it within 24 hours after donation using a cryoprotective solution. One of two methods of cryopreservation is used with the use of dimethylsulfoxide (DMSO, 6% w/v) or very low concentration of glycerol (5% w/v)

Definition

Platelet concentrate cryopreserved, recovered- blood component obtained from Platelet concentrate cryopreserved, contains more than 40% of the original component.

Preparation

Platelet concentrate cryopreserved, recovered is obtained by washing and resuspending in plasma or an additive solution. After defrosting the component, the " snowstorm" phenomenon is not observed.

Using

Platelet concentrate cryopreserved, recovered is used for clinical practice in adults and children.

Quality criteria

Verification parameter	Quality requirements (specification)	Control frequency*	Who controls it
ABO, Rh (D)	Typing	All doses	Department of blood testing and laboratory researches
ALT	Not increased	All doses	
HBsAg	Negative in an approved screening test	All doses	
Anti-HCV	Negative in an approved screening test	All doses	
Anti-HIV 1.2	Negative in an approved screening test	All doses	
Syphilis	Negative in screening test	All doses	
Volume	From 50 to 200 ml	All doses	Department of preparation of blood and its components
The content of platelets*	At least 40 % of the content before freezing	All doses	Department for quality control of blood products
Residual leukocytes** in leukofiltered component	<1x10 ⁶ per final dose	All doses	
pH (at +22°C) measured at the end of the recommended shelf life***	>6.4	1 % of all doses, at least 4 doses per month	

Note: * The requirements are met if 75% of the tested doses fall within the specified range.

** The requirements are met if 90% of the tested doses fall within the specified range.

*** Measurement of pH is carried out in a closed system to avoid the release of CO₂. The measurement can be performed at any temperature and the value is recalculated for the pH at +22°C.

Storage and transportation

Storage of Platelet concentrate cryopreserved is carried out:

in an electric refrigerator at a temperature of -80°C;

in liquid nitrogen vapors at a temperature of -150°C.

If the Platelet concentrate cryopreserved is stored for more than a year, the storage temperature shall be -150°C.

During transportation of Platelet concentrate cryopreserved storage temperature is maintained.

Platelet concentrate cryopreserved recovered is used as quickly as possible or intermediate storage and transportation at a temperature of + 20°C +24°C is ensured.

Marking

Information is recorded on the label of Platelet concentrate cryopreserved:

name of the organization- manufacturer;

unique identification number of the donation;

name of the blood component;

blood group according to ABO system and Rhesus affiliation Rh(D);

date of donation;

expiration date;

name and volume of the cryoprotective solution;

additional information (if necessary);

volume;

storage temperature.

Information is recorded on the label of the Platelet concentrate cryopreserved recovered:

name of the organization- manufacturer;

unique identification number of the donation;

name of the blood component;

blood group according to ABO system and Rhesus affiliation Rh(D);

HLA type, if determined;

date of preparation;

expiration date and time, if required;

name and volume of the cryoprotective solution;

note on additional processing (irradiance, leukofiltration);

volume;

number of platelets (average, if the method of obtaining is validated or real)

storage temperature;

information that the component is introduced through a filter with a pore size of 150-200 microns.

Precautionary measures

Platelet concentrate cryopreserved recovered is not used in patients with plasma protein intolerance.

Adverse reactions

When transfusion of Platelet concentrate cryopreserved recovered there are risks of developing conditions:

hemolytic posttransfusion reaction in case of blood group mismatch in the ABO system;

non-hemolytic posttransfusion reaction (most often-chills, fever, urticaria);
anaphylaxis;

alloimmunization by erythrocytes and HLA antigens;

alloimmunization by HPA antigens;

post-transfusion purpura;

“graft versus host” reaction;

the syndrome of acute lung injury due to transfusion (SALI);

sepsis, caused by accidental bacterial contamination;

transmission of viral infection (hepatitis, HIV, and others) is not excluded, despite the careful selection of the donor and examination of the donor's blood by modern methods; it does not apply to the components that have undergone virus inactivation, for which this is unlikely;

risk of transmission of protozoal infection (malaria);

transmission of other unidentified or non-mandatory screening pathogens;

circulatory overload.

20. Granulocytes apheresis

Definition

Granulocytes apheresis - a component of blood, contains plasma-suspended granulocytes obtained from one donor, in addition, the dose contains a significant amount of erythrocytes, lymphocytes, platelets.

The adult therapeutic dose of the component contains $1,5 \times 10^8 - 3,0 \times 10^8$ granulocytes per kilogram of the recipient's weight

Receiving

Granulocytes apheresis are obtained using automated cells separation, precipitation of erythrocytes is made by hydroxyethyl starch, low-molecular dextran or modified liquid gelatin.

Using

Microaggregate and leucocyte filters are not used.

Before clinical use, the component is irradiated.

Note

Clinical efficiency, indications, and dosage are not determined. Before donation, the donor receives medicines (corticosteroids and growth factors), and during apheresis , precipitating agents are used, so severe side effects are not excluded. Informed voluntary consent of the donor is required.

Side effects of apheresis:

hydroxyethyl starch (hereinafter - HES) leads to an increase in the volume of circulating blood, as a result, the donor may experience headache, peripheral edema. HES can cause allergic reactions and itching;

corticosteroids can, among other things, cause hypertension, diabetes, cataracts, and peptic ulcer disease;

granulocyte colony-stimulating factor can cause bone pain, rarely rupture of the spleen, and lung damage.

Quality criteria

Verification parameter	Quality requirements (specification)	Control frequency*	Who controls it
ABO, Rh (D)	Typing	All doses	Department of blood testing and laboratory researches
ALT	Not increased	All doses	
HBsAg	Negative in an approved screening test	All doses	
Anti-HCV	Negative in an approved screening test	All doses	
Anti-HIV 1.2	Negative in an approved screening test	All doses	
Syphilis	Negative in screening test	All doses	
HLA (if necessary)	Typing	At the request	Department of typing
Volume	<500 ml	All doses	Department of preparation of blood and its components
The content of granulocytes**	Clinical dose for an adult patient weighing 60 kg 0,9-1, 8x10 ¹⁰ per dose	All doses	Department for quality control of blood products

Storage and transportation

Granulocytes apheresis are not stored and are transfused as quickly as possible after preparation.

When transporting the component, the temperature from +20°C to +24°C is maintained, and it is not shaken.

Marking

Information is recorded on the label:

name of the organization-manufacturer;

unique identification number of the donation;

name of the blood component;

blood group according to ABO system and Rhesus affiliation Rh(D);

HLA type, if determined;

date of donation;

expiration date and time;

name of the anticoagulant and the additive solutions and other agents;

note on additional processing (irradiance);

volume;

number of granulocytes;

storage temperature;

information that the component is introduced through a filter with a pore size of 150-200 microns.

Precautionary measures

During transfusion of Granulocytes apheresis, tests for individual compatibility of the blood of the donor and the recipient according to ABO and rhesus are performed.

In alloimmunized patients, a study of HLA compatibility is performed.

There is a risk of complications in patients taking antibiotics "amphotericin B".

Adverse reactions

When transfusion of Granulocytes apheresis there are risks of developing conditions:

non- hemolytic posttransfusion reaction (most often-chills, fever, urticaria);

alloimmunization by antigens of erythrocytes, HLA, HPA, HNA;

post-transfusion purpura;

“graft versus host” reaction;

the syndrome of acute lung injury due to transfusion (SALI);

sepsis, caused by accidental bacterial contamination;

transmission of viral infection (hepatitis, HIV, and others) is not excluded, despite the careful selection of the donor and examination of the donor's blood by modern methods; it does not apply to the components that have undergone virus inactivation, for which this is unlikely;

risk of transmission of protozoal infection (malaria);

transmission of other unidentified or non-mandatory screening pathogens;

citrate intoxication in newborns and patients with impaired liver function;

accumulation of HES in patients after repeated transfusions.

21. Hematopoietic stem cells

Definition

Hematopoietic stem cells (hereinafter-HSCs) - a part of the tissue of internal environment of the body, human bone marrow cells that have polypotency and are located in the bone marrow, peripheral blood (after stimulation) and umbilical cord blood during life.

HSCs are estimated by the number of nucleated cells and CD34+.

Isolated stem cells are in autologous plasma.

Receiving

Peripheral blood HSCs are obtained by hardware cytapheeresis after the mobilization procedure (an increase in the number of stem cells after the use of drugs-hematopoietic growth factors in donors).

For freezing, HSCs are mixed with a cryoprotector - highly purified dimethylsulfoxide (DMSO), including in combination with dextran. The cryosack with HSCs is hermetically sealed in a cryoprotective wrapping bag. Cryofreezing of HSCs is performed using cooling methods with uncontrolled and (or) controlled (1-30C/min) rate of temperature reduction.

HSCs are not irradiated.

Quality criteria

Verification parameter	Quality requirements (specification)	Control frequency *	Who controls it
ABO Rh (D) - allogeneic	Typing	All donations	Immunological laboratory
HLA-allogeneic	Typing	All donations	Immunological typing laboratory
Anti-HIV-1,2 and p24	Negative*	All donations	Laboratory of transfusion infections
HBsAg	Negative*	All donations	
Anti-HCV	Negative*	All donations	
Syphilis	Negative*	All donations	
Anti-CMV	Negative*	All donations	
Viability of leukocytes	At least 80%	All donations	Immunological laboratory
Sterility	Sterilely	All donations	Bacteriological laboratory

Note: * the study is conducted using a method, specifically approved for the donor examination.

The decision to allow a donor of peripheral blood hematopoietic HSCs to donate HSCs is made by the recipient's attending physician (autodonor).

Storage and transportation

After cryofreezing, the HSCs are placed on cryopreservation at a temperature not exceeding -80°C for a period of no more than 2 months, followed by transfer to cryopreservation at a temperature not exceeding -150°C in a dewar with liquid nitrogen. Each series of HSCs is accompanied by an additional satellite, allowing to conduct necessary tests in a remote period, which is stored under the same identification number.

During transportation of HSCs, the storage temperature is maintained.

Marking

Cryosack with HSCs, intended for cryo-freezing and cryopreservation, is marked with a unique letter, number and bar code indicating the concentration and composition of the cryoprotector, the date of cryopreservation, name of the organization of blood service. An additional satellite with a sample of each HSCs series is marked with the same identification number.

Precautionary measures

During HSCs transplantation, a study of tissue compatibility and tests for compatibility of erythrocytes group antigens of the recipient and donor is performed.

Adverse reactions

When using HSCs there are risks of developing conditions:
hemolysis or prolonged engraftment due to incompatibility of erythrocytes of the donor and recipient;
transplant rejection;
sepsis, caused by accidental bacterial contamination;
transmission of viral infection (hepatitis, HIV, and others) is not excluded, despite the careful selection of the donor and examination of the donor's blood by modern methods;
risk of transmission of protozoal infection (malaria);
transmission of other unidentified or non-mandatory screening pathogens;
adverse effect of the cryoprotector on the recipient's health.

22. Blood whole, leukofiltered for exchange transfusion

Definition

Blood whole, leukofiltered for exchange transfusion – a blood component corresponding to the blood component – the Blood whole, leukofiltered.

Preparation

The volume of the initial component is reduced – the Blood whole, leukofiltered, taken no later than 5 days after donation, by removing part of the plasma after centrifugation to achieve the clinically prescribed hematocrit.

Quality criteria

Corresponds to the conditions for a component the Blood whole, leukofiltered.

Storage and transportation

Corresponds to the conditions for a component the Blood whole, leukofiltered except:

used within five days after donation;
it is subject to mandatory irradiation and is used after irradiation for 24 hours.

Marking

Corresponds to the conditions for a component of the Blood whole, leukofiltered and additionally:

blood group phenotype, if the antibodies are of a nature other than anti-RhD;
changed expiration date and time.

Precautionary measures

Before transfusion, the compatibility of the component the Blood whole, leukofiltered, for exchange transfusion with the blood of the mother and fetus, is carried out in accordance with the legislation of the Republic of Kazakhstan. The compatibility of the donor's blood group with any maternal antibodies is also being conducted.

Control of the transfusion rate is required to prevent excessive fluctuations in blood volume.

It is subjected to radiation, due to high risk of complications of the “graft versus host” reaction;

Adverse reactions

There are risks of spreading adverse reactions to the mother.

Corresponds to the conditions for the Blood whole component, leukofiltered and additionally:

cytomegalovirus infection;

metabolic disorders, such as hypocalcemia, hyperkalemia, hypokalemia, hypoglycemia;

thrombocytopenia;

circulatory overload;

citrate intoxication.

23. Erythrocyte mass, leukofiltered for exchange transfusion

Definition

Erythrocyte mass, leucofiltered for exchange transfusion - blood component, used for exchange transfusion, contains less than 1×10^6 of leukocytes.

Preparation

Erythrocyte mass, leukofiltered for exchange transfusion is obtained by recycling the Blood whole leukofiltered or Erythrocyte suspension, leukofiltered with a shelf life not more than 5 days with regulation of a clinically required hematocrit by partial removal of plasma or additive solution.

If the mother has anti-RhD antibodies, the component is prepared from the blood of the group O anti-RhD-negative group. If the mother has antibodies of a different specificity, the selected erythrocytes must be antigen-negative for any concomitant antibodies present in the mother 's blood.

Quality criteria

Corresponds to the conditions for Erythrocyte mass, leukofiltered except:

hematocrit indicator corresponds to 0.70-0.85;

frequency of control - all doses.

Storage and transportation

Corresponds to the conditions for Erythrocyte mass, leukofiltered except:

erythrocytes are used within five days after donation;

erythrocytes are subject to mandatory irradiation and used after irradiation for 24 hours.

Marking

Corresponds to the conditions for Erythrocyte mass, leukofiltered and additionally contains information:

changed preparation date and time;
changed expiration date and time;
hematocrit of the component.

Precautionary measures

Before transfusion, the compatibility of Erythrocyte mass, leucofiltered for intrauterine transfusion with the blood of the mother and fetus using the ABO system is conducted.

If the fetal blood group is unknown, the blood component with the group O Rh negative is used, taking into account the mother's antibodies. Erythrocytes must be antigen-negative for any concomitant antibodies present in the mother.

Adverse reactions

Corresponds to the conditions for Erythrocyte mass, leucofiltered and additionally: the fetus is particularly vulnerable to the following adverse reactions-cytomegalovirus infection; metabolic disorders, such as hyperkalemia.

24. Erythrocyte mass, leukofiltered for intrauterine transfusion

Definition

Erythrocyte mass, leucofiltered for intrauterine transfusion - blood component, used for intrauterine transfusion having a hematocrit of 0.70-0.85 and containing less than 1×10^6 of leukocytes.

Receiving

Erythrocyte mass, leucofiltered for intrauterine transfusion is obtained by recycling the original components of the Blood whole leucofiltered or Erythrocyte suspension, leucofiltered with partial removal of plasma or an additive solution.

Quality criteria

Corresponds to the conditions for Erythrocyte mass, leukofiltered except:
hematocrit indicator corresponds to 0.70-0.85;
frequency of control - all doses.

Storage and transportation

Corresponds to the conditions for Erythrocyte mass, leukofiltered except:
erythrocytes should be used within five days after donation;
erythrocytes must be subjected to mandatory irradiation and used after irradiation within 24 hours.

Marking

Corresponds to the conditions for Erythrocyte mass, leukofiltered and additionally contains information:

changed preparation date and time;
changed expiration date and time;
hematocrit of the component.

Precautionary measures

Before transfusion, the compatibility of Erythrocyte mass, leucofiltered for intrauterine transfusion with the blood of the mother and fetus is conducted.

If the fetal blood group is unknown, the blood component with the group O Rh negative is used, taking into account the mother's antibodies. Erythrocytes must be antigen-negative for any concomitant antibodies present in the mother.

Adverse reactions

Corresponds to the conditions for Erythrocyte mass, leucofiltered and additionally: the fetus is particularly vulnerable to the following adverse reactions-cytomegalovirus infection; metabolic disorders, such as hyperkalemia.

25. Platelet concentrate leukofiltered for intrauterine transfusion

Definition

Platelet concentrate, leucofiltered for intrauterine transfusion – a blood component obtained from one donor from a dose of the Blood whole or by apheresis method. The component contains $45-85 \times 10^9$ (average 70×10^9) of platelets in 50-60 ml of suspension medium.

Preparation

Platelet concentrate, leucofiltered for intrauterine transfusion is obtained from Platelet concentrate, recovered from a dose of blood or Platelet concentrate apheresis by superconcentration - removing part of the plasma during centrifugation. After centrifugation, the component is kept at rest for 1 hour.

Quality criteria

Corresponds to the conditions for Platelet concentrate recovered from the dose of blood leukofiltered except:

platelets content $45-85 \times 10^9$,

volume 50-60 ml;

HLA typing of the donor's blood if necessary.

Storage and transportation

Corresponds to the conditions for Platelet concentrate recovered from the dose of blood leukofiltered, platelets are used within six hours after any secondary concentration process.

Marking

Corresponds to the conditions for Platelet concentrate recovered from the dose of blood leukofiltered and additionally:

if the dose is divided into smaller doses, each dose is assigned a unique number to ensure traceability of using the part of the component;

additional information includes data on the decrease in plasma or supernatant volume;

changed expiration date and time.

Precautionary measures

Before transfusion of the component, irradiation is conducted, due to high risk of complications of the “graft versus host” reaction.

The transfusion rate is monitored.

The risk of bleeding after the puncture is taken into account.

Adverse reactions

There is a possibility of spreading adverse reactions to the mother.

Corresponds to the conditions for Platelet concentrate recovered from the dose of blood leukofiltered and additionally:

the fetus is particularly vulnerable to the following adverse reactions-cytomegalovirus infection.

26. Erythrocyte mass for transfusion to newborns and young children (small volumes)

Definition

Erythrocyte mass for transfusion to newborns and young children (small volumes) - a blood component, prepared on the basis of one of the components – Erythrocyte mass with removed LTL, Erythrocyte leucofiltered, Erythrocyte suspension leucofiltered.

Receiving

Erythrocyte mass for transfusion to newborns and young children (small volumes) is prepared by dividing the selected initial component into 3-8 equal parts through a functionally closed system. If there are clinical indications, the component is irradiated.

Storage and transportation

Meet the requirements for the original component.

Marking

Meet the requirements for the original component and additionally:

Each subunit of the component has a unique identification number to ensure the traceability of the donation;

volume;

expiration date and time.

Precautionary measures

The transfusion rate is monitored.

Adverse reactions

Meet the requirements for the original component and additionally: CMV infection; metabolic disorders, for example hyperkalemia; citrate intoxication; circulatory overload; “graft versus host” reaction.

27. Components of autologous blood

The quality of blood components prepared for autologous transfusions is determined in accordance with the specifications adopted for allogeneic blood components in these Regulations.

Autologous blood components are stored separately from allogeneic blood components.

When labeling autologous blood components, in addition to the information accepted for the corresponding component of allogeneic blood, the inscription "AUTOLOGOUS DONATION",

"USE FOR:

surname, name, patronymic (if any), full date of birth, patient identification number (if accepted)."

Unused autologous blood components are not used for allogeneic transfusion or fractionation.

28. Plasma enriched with soluble platelet factors auto/allogeneic, for local use

Definition

Plasma enriched with soluble platelet factors auto/allogeneic for local use - a component of blood not for transfusion, but for local use, obtained from a dose of the Blood whole. It contains most part of platelets of the original whole blood suspended in plasma and contains 1.5×10^9 platelet cells per ml.

Preparation

Prepared by one of the methods:

from plasma enriched with platelets (PEP);

from leukotrombocyte layer (LTL);

Using

Plasma enriched with soluble platelet factors (PESPF), allogeneic is used for:

application to skin or mucous surfaces ("topical use");

introductions to tissues;

local application to a surgical wound, including together with other biomaterials or medical products.

Requirements and quality control

Verification parameter	Quality requirements (specification)	Control frequency*	Who controls it

ABO, Rh (D)	Typing	All doses	Department of blood testing and laboratory researches
ALT	Not increased	All doses	
HBsAg	Negative in an approved screening test	All doses	
Anti-HCV	Negative in an approved screening test	All doses	
Anti-HIV 1.2	Negative in an approved screening test	All doses	
Syphilis	Negative in screening test	All doses	
Volume	2.0 ml	All doses	Department of preparation of blood and its components
Platelets content in the final dose**	3,0x10 ⁹	1 % of all doses, at least 10 doses per month	Department for quality control of blood products
Sterility	Sterilely	All doses	

Note: *- Parameter "control frequency", if it is different from the value "All doses", displays the minimum frequency of testing and indicates the necessity for statistical control of the process to reduce the risk of deviations in the quality of the blood component.

* * The requirements are met if 90% of the tested doses fall within the specified range.

Storage and transportation

Plasma enriched with soluble platelet factors (PESPF), allogeneic is carried out in a frozen state at a temperature below minus 250C, the maximum shelf life is 12 months.

Marking

Label marking must comply with the requirements of national legislation and international agreements.

The frozen dose label contains the following information:

name of the organization-manufacturer;

unique identification number, series number;

name of the blood component;

blood group according to ABO system and Rh affiliation Rh(D);

preparation date;

expiration date;

storage temperature;

information that the component is introduced through a filter with a pore size of 150-200 microns.

Adverse reactions:

When using Plasma enriched with soluble platelet factors (PESPF) allogeneic, there are no adverse reactions.

29. Lymphocytes apheresis with photochemical processing

Definition

Lymphocytes apheresis with photochemical processing – an autologous component of blood used for treatment, which is based on photodynamic effect of ultraviolet rays of spectrum A on suspension of blood lymphocytes of a patient with preliminary addition of light-sensitive drug 8-methoxypsoralen to it (8-MOP).

Preparation

1. Collection of lymphocytes is carried out by hardware cytapheresis;
2. Adding 8-MOP to the cell suspension at the calculated dose;
3. Photodynamic effect (photo processing): irradiation with ultraviolet rays of the spectrum A with an exposure of 1-2 J/cm²;
4. Issuance for the reinfusion.

Using

Extracorporeal photopheresis is an additional method of therapeutic treatment of various pathologies associated with immune system dysfunction. The most widely known clinical experience of using EP in the following diseases and conditions:

- cutaneous T-cell lymphoma, Cesari Syndrome, and other cancers;
- prevention and treatment of acute and chronic “graft versus host” reaction;
- rejection of transplanted solid organs;
- autoimmune diseases and dermatoses.

Quality criteria

Verification parameter	Quality requirements (specification)	Control frequency*	Who controls it
ABO, Rh (D)	Not required		Department of preparation of blood and its components, department of cryobiology
ALT	Not required		
HBsAg	Not required		
Anti-HCV	Not required		
Anti-HIV 1.2	Not required		
Syphilis	Not required		
Volume	100.0-300.0 ml	All doses	
Level of hematocrit in the final dose	Less than 2%	All doses	
Content of erythrocytes in the final dose	Less than 0, 5x10 ⁹ /l	All doses	
Sterility	Sterilely	All doses	

Note:

* Parameter "control frequency", if it is different from the value "All doses", displays the minimum frequency of testing and indicates the necessity for statistical control of the process to reduce the risk of deviations in the quality of the blood component.

Storage and transportation

Storage and transportation of the processed cell suspension is carried out at a temperature from +20°C to +24°C for no more than 6 hours from the moment of preparation.

Marking

Label marking must comply with the requirements of national legislation and international agreements.

The dose label must contain the following information:

name of the organization-manufacturer;

unique identification number;

name of the blood component;

patient's date of birth;

preparation date;

expiration date;

storage temperature;

information that the component is introduced through a filter with a pore size of 150-200 microns.

Adverse reactions:

When using Concentrate of lymphocytes for extracorporeal photopheresis, there are no adverse reactions.

Appendix 2
to the order of the
Minister of Healthcare
of the Republic of Kazakhstan
dated April 15, 2019
№ KR MHC-34

List of invalid orders of the Ministry of Healthcare of the Republic of Kazakhstan

1. Order of the acting Minister of Healthcare of the Republic of Kazakhstan dated November 10, 2009 № 680 "On approval of the Rules for medical examination of a donor before donation of blood and its components" (registered in the Register of state registration of regulatory legal acts № 5934, published in the collection "Collection of acts of central executive and other central state bodies of the Republic of Kazakhstan № 6, 2010").

2. Order of the acting Minister of Healthcare of the Republic of Kazakhstan dated November 10, 2009 № 684 "On approval of the Rules for quality control and safety of

donor blood and its components" (registered in the Register of state registration of regulatory legal acts № 5930, published in the collection "Collection of acts of central executive and other central state bodies of the Republic of Kazakhstan № 5, 2010").

3. Order of the acting Minister of Healthcare of the Republic of Kazakhstan dated August 2, 2012 № 524 "On amendments to some orders of the acting Minister of Healthcare of the Republic of Kazakhstan" (registered in the Register of state registration of regulatory legal acts № 7899, published in the collection "Collection of acts of central executive and other central state bodies of the Republic of Kazakhstan № 23, 2012").

4. Paragraphs 2, 3 of the Appendix to the order of the Minister of Healthcare and social development of the Republic of Kazakhstan dated May 29, 2015 № 417 "On amendments and additions to some orders of the acting Minister of Healthcare of the Republic of Kazakhstan" (registered in the Register of state registration of regulatory legal acts № 11531, published in the information and legal system "Adilet" dated 21.07.2015).