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| <b>Study program:</b> Integrated Academic Studies in Medicine  |
| <b>Course title:</b> Transfusion Medicine  |
| <b>Teacher:</b> Svetlana I. Vojvodić, Zorana P. Budakov Obradović, Jasmina N. Grujić, Nevenka B. Bujandrić, Jelena Ž. Klačnja  |
| <b>Course status:</b> compulsory   |
| <b>ECTS Credits:</b> 2   |
| <b>Condition:</b> -  |
| <p><b>Course aim</b></p> <p>Students will acquire the necessary knowledge about the basic principles of modern transfusion medicine, blood donation principles and motivational and educational work in the field of blood donation, the selection of donors and blood collection, manufacturing, testing and storage of blood products and their clinical applications. Significance of immunohematology in transfusion medicine. Transfusion laboratory diagnostics and its importance in the quality control of blood products and the safety of their clinical application. The place and role of transfusion medicine in transplantation and its relationship with other medicine branches.</p>   |
| <p><b>Expected outcome of the course:</b></p> <p>Students will gain knowledge in all fields of transfusion medicine: motivation work for blood donation, the selection of voluntary donors, health check of voluntary donors and blood collection, special forms of voluntary blood donation; testing according to the law that must be carried out on samples of blood from volunteer donors in order to ensure safe transfusion (determination of the blood groups ABO and RhD antigen, determination of the presence of irregular antibodies, and the presence of markers of transfusion-transmitted diseases: hepatitis B and C, HIV and Syphilis); current techniques for separation of blood constituents from a blood unit and national principles of blood products clinical use, preservation and storage of blood products; introducing with pretransfusion testing that is necessary for the distribution of blood products; introducing with risks and side-reactions during and after the application of blood components; introducing to techniques of transfusion laboratory diagnostics and transfusion basics of transplantation, prenatal care of pregnant women, immunohematological monitoring of transfused patients.</p>   |
| <p><b>Course description</b></p> <p><i>Theoretical education</i></p> <p>1. History of transfusion medicine. Basic concepts in transfusion and its tasks. Relationship with other branches of medicine. Organisation of the transfusion service. Ethical aspects of transfusion medicine. Legislation. 2. Blood donation: the principles of organisation in our country and in the world, the conditions for giving blood (indications) and contraindications. The selection of blood donors, laboratory and medical examination, blood collection and complications after blood donation. 3. Conservation of blood, packaging, anticoagulants and optimal additive solutions, changes in blood during storage. Particular forms of blood donations and complications in the procedure of blood donation: autologous blood donation and apheresis procedures (plasmapheresis, cytappheresis). 4. Genetic and immunologic bases in transfusion: blood group polymorphism; red blood cell membrane; blood group antigens and antibodies; antigen-antibody reaction, agglutination, hemolysis, immune response in transfusion. The complement system and its importance in transfusion practice. 5. The ABO blood group system: antigens, antibodies, their role in transfusion, anthropology and forensic medicine. Rhesus blood group system: antigens, antibodies, and the importance and the role in transfusion regarding the posttransfusion reactions and morbus hemolyticus neonatorum (MHN). Other erythrocyte blood group systems: MNSs, P Kell, Kidd, Duffy, Lewis, Lutheran and their clinical significance. 6. The HLA system: genetics, structure, antigens and antibodies and the importance and the role in blood transfusion,</p> |

transplantation of tissues and organs, anthropology and association with diseases. Human Platelet Antigens, anti-platelet antibodies, and their clinical significance. Leukocyte Antigens, antileukocyte antibodies and their clinical significance. 7. Place, role and importance of transfusion in transplantation medicine. Basic laboratory tests in transfusion (perinatal, immunohaematological). 8. The basic principles of the selective / directed transfusion of blood products and the production, storage, transport of blood, labeling and standardization of blood products. Selection of blood products, pretransfusion testings and transfusion compatibility tests. 9. Erythrocyte transfusion products: conservation types, selection and application of transfusion. Transfusion of platelets: physiological basis, preparation and conservation, therapeutic applications. Fresh frozen plasma, and drugs (derivates) from plasma: various forms of plasma, human blood clotting factors, albumin, immunoglobulins, their preparation, indications for therapeutic use. 10. Cryopreservation of blood cells; Substitutes of blood. 11. The risks in transfusion therapy. Adverse effects of chemotherapy and treatment of transfusion reactions. 12 Quality and safety in transfusion; Good Manufacturing and Good Laboratory Practice in transfusion. 13. Laboratory testing of markers that are transmitted by blood transfusion: posttransfusion hepatitis B and C, HIV, and syphilis. 14. Basics in blood products administrations with specificities in transfusion treatment of paediatric patients, in surgery and in obstetrics and gynaecology. 15 Apheresis therapy procedures.

#### *Practical education*

Introduction to the principles of blood donation, medical history / questionnaire, control of hemoglobin, review of voluntary donors, venipuncture, taking care of collapse, the procedure of the plasma and cytapheresis; autologous transfusion. Immunology and serology of blood groups: the different techniques for determining the blood group ABO system. Determination of the Rh antigens, variants of Rh antigens (partial and D weak); the character of the antibody in Rh system, posttransfusion reactions and sensitisation in pregnancy, immunological features of MHN. Determination of other red blood cell-blood group antigen systems: MNSs, P, Kell, Duffy, Kidd, Lewis, Lutheran. HLA system: antigens, antibodies, methods of testing. Modern laboratory techniques in the field of transfusion. Preparation of blood products: red blood cells, platelets, leukocytes, fresh frozen plasma, cryoprecipitate; labeling, conservation; standardization; quality control. Transfusion investigation and selection of blood for transfusion. Genetic and immunologic bases in transfusion: direct and indirect Coombs' test, the cold agglutinins, antiplatelet and antileukocyte antibodies. Testing of markers of transfusion-transmitted diseases: hepatitis B and C, HIV, and syphilis: methodology and interpretation of results, the algorithm of testing.

#### **Literature**

- Klein HG, Anstee DJ, Mollison's Blood Transfusion in Clinical Medicine, 12th Edition, Wiley-Blackwell, 2014.
- Material from the lectures

**Number of active classes**

**Theoretical classes: 15**

**Practical classes: 15**

**Teaching methods:** lectures and practical work

#### **Student activity assessment** (maximally 100 points)

| <b>Pre-exam activities</b> | <b>points</b> | <b>Final exam</b> | <b>points</b> |
|----------------------------|---------------|-------------------|---------------|
| Lectures                   | 10            | Written           | 10            |
| Practices                  | 20            | Oral              | 60            |
| Colloquium                 |               | .....             |               |