Course Syllabus of Blood Transfusion

Faculty: Medicine and Health Sciences
Department: Health Sciences
Program: Bachelor in Medical laboratory

I. General information about the course instructor :

Name	Dr .Abdulrazzaq Othman Alagbare	Office Hours(3 Hours Weekly)					
Location & phone number	Sana'a 777182124	Sat	Sun	Mon	Tue	Wed	Thu
Email	alagbariz@yahoo.com	1		1		1	

II. General information about the course :

1.	**Course Title:**	**Blood transfusion**				
2.	**Course Code and Number :**	**BML355**				
3.	**Credit Hours**	**Lecture**	**Seminar/Tutorial**	**Practical**	**Training**	**Total**
		2		**1**		**3**
4.	**Study Level and Semester:**	**3rd year/ 1st semester**				
5.	**Pre-requisites :**	**BML244**				
6.	**Co-requisites :**	**None**				
7.	**Program in which the course is offered**	**Bachelor in Medical laboratory**				
8.	**Teaching Language:**	**English**				
9.	**Study System :**	**Semester based**				
10.	**Prepared by :**	**Dr .Abdulrazzaq Othman Alagbare**				

III. Course Description:

This course provide to the student in the medical laboratory with basic knowledge about the basic blood transfusion science and immunohematology .It help them to understand how the blood group systems developed , biochemistry structure, subgroups, and different types of blood group systems, genetic disorders and their importance in blood banking medicine evaluation. It establishes a knowledge to

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عميد الكلية:
د. عبد الله المخلافي
27.2.2019

رئيس القسم:
د. عبد الحبيب ردمان
٢٠١٩/١٢/٠

المراجع :
د. محمد المريش
د. مجاهد نصار

الموصف :
د. عبد الرزاق الاغبري

understand the blood donation, blood component apheresis and separation for therapeutic purposes, and the main problems on blood transfusion reaction and how to meet its by laboratory managements. The teaching will include lecture, collaborative learning, self-learning, dialogue, discussion and assignment. The students will be evaluated through report, written exam and practical exam. The immunology course must be taken by the student as a prerequisite course .

IV. Course Aims: This course aimed to ;

1. Provide the student the knowledge about blood component and antigen – antibodies, nature and role, the production of A, B, and H antigens and Secretors and Non secretors, Bombay and Para-Bombay blood group and understanding Kell, Lewis Duffy, MNS ,Kidd, importance etc.
2. Apple to understand the biochemistry of the ABO system and the weaker subgroups, ABO Typing, Explain the importance of the RHD and RHCE loci and D antigen variants
3. Enable the student to recognize the blood donation types, deferrals , pre donation tests.
4. Understanding the main methods of blood compatibility tests, cross matching, Abs screening testing for infectious disease markers, etc.
5. Improving the skills of apheresis ,keeping and transporting blood components for daily and longtime uses
6. Understanding the new technology of cross matching, irradiated blood component etc
7. Familiarize the students with the major categories of transfusion reactions, bacterial contamination and allergic transfusion reactions and how to prevent them .

V. Course Intended Learning Outcomes (CILOs) :

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After completion of this course student should be able to:

1. Outline the different theories of blood group genetic structure, the nomenclature, and recognize the most system which are used in the clinical laboratory.
2. Describe and Discuss the information included in a complete donor registration. And the administration of the donor history questionnaire.
3. State the forward and reverse blood typing tests, cross matching, antibodies screening testing for infectious disease markers Uses of different antisera and Lectins to differentiate between blood group and subgroup .
4. **Compare** between different blood groups , subgroup, RH variants, to know the importance of each one.
5. Solve and interpret the results, detecting errors and the related finding with the patient case.
6. **Carry out** the different blood banking, and a transfusion reaction investigation.
7. **Collect , apheresis, keeping and transport** specimens, using the appropriate methods .
8. **Apply** Quality control and Safety process how to handle, and avoided the hazardous contaminated risks factors.
9. Cooperate with his or her head masters. and solve any problem with mind and patient, respect the privacy of the patient.

VI. Course topics and sub-topics (theoretical and practical) with contact hours and alignment to CILOs

Topics/Units of Course Contents

First: Theoretical Aspects

No.	Course Topics/Units	Sub-topics	No. of Weeks	Contact Hours
1	Blood component Biochemistry of the ABO system 1 Biochemistry of the ABO system 2	Antigen – antibodies • Production of A, B, and H antigens. • Secretors and Non secretors • Production of A, B blood group. • A.B antibodies production • Bombay blood group	1st	2
2	ABO blood group Bombay and parabombay blood group - Blood Subgroup A,B 1	• Antigens and antibodies • Natural antibodies Immune antibodies • The nature of blood group antigens • Subgroups of A and B inheritance • weaker subgroups, ABO Typing	2nd	2

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3	Discrepancies in ABO typing causes Group A (Genotypes AA or AO) Lectins,.. lectins uses in Blood Bank Lectin-Reactions Expression of the H antigen	• Uncommon H Phenotypes • The Hh blood group , • Para-Bombay phenotype	3rd	2
4	General other blood groups Rh Blood Group System - Introduction and history Rh antigens Characteristics The RHD and RHCE loci Inheritance and nomenclature of the Rh system	• The Kell Blood Group System • The Duffy blood group, MNS SYSTEM, Kidd Blood Group System; Lewis System • Fisher-Race system • Tippett Theory, Weiner system Rosenfield Nomenclature system	4th	2
5	Rh Blood Group System Inheritance pattern with Cis and Trans position Phenotyping and genotyping of Rh system 1 Rh antibodies Laboratory detection	• Fisher-Race and Wiener Nomenclature, Understanding of Rh genetics/structure • Antibodies types produced against Rh antigens • Rh antibodies importance • Rh- Possible genotypes • Paternity Testing	5th	2
6	Phenotyping and genotyping of Rh system 2 Hemolytic disease of Newborn (HDN), Cause of Hemolytic Disease Maternal antibodies and fetal red blood cells Complications During Pregnancy	• Types of anti-D (reagents) • Uncommon Rh phenotypes • They are a group of D antigen variants such as 1-WeakD D^u 2-Parital D phenotype 3-RH null: 4-Rh Deleted 5-LW (Landsteiner and Wiener.) 6-C^w	6th	2
7	Midterm		7th	2
8	Blood donation and blood collection Blood transfusions and the immune system Pre transfusion Tests ANTIBODY SCREEN of	• Types of deferral • Types of blood donors • Screening test for donors blood • Donor Reactions • Blood group immunology	8th	2

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	alloantibodies	• Naturally Occurring Alloantibodies • Unexpected or Immune Alloantibodies • Blood Transfusions • Donor Basic Testing • Rhesus Grouping • ABO Blood Typing and Compatibility		
9	Compatibility Testing or "crossmatch" types of cross matches: Emergency conditions Blood donation and blood collection Blood Component Storage Lesion Blood components apheresis A standard blood cell separator	Immediate spin (IS) cross-match Full cross match: Electronic crossmatch Blood transfusion and apheresis Approved Anticoagulant Preservative Solutions Contents Additive Solutions Blood storage	9th	2
10	Erythrocytes transfusion Indications for RBC units Contraindications for RBC units Apheresis RBC Donation The cryopreservation of blood	Whole blood transfusion Apheresis of whole blood Whole blood separated into different parts Blood product modifications Modified RBC unit 1-Red cell concentrates (RCC), ("packed red blood cells" (PRBCs). 2-;RBC Freezing -Thawed red cells 3-Leukocyte-reduced RBCs 4-CMV negative RBCs 5-Washed RBCs 6-Irradiated RBCs	10th	2
11	Platelets and plasma transfusion Indications for Platelets transfusion Granulocyte Transfusion Granulocytes Collection Plasma Fresh frozen plasma Frozen plasma Cryoprecipitate Stored plasma	Apheresis platelets A single platelet unit Pooled platelets Failure of expected platelet increment Modified Platelet Units Washed platelets Leukocyte-reduced platelets Irradiated Indications granulocytes transfusion	11th	2

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	Plasma Derivatives Plasma protein fractionation Appropriate storage temperatures Component: Irradiated Blood & Components	Complication of granulocytes transfusion Indications for FFP Cryoprecipitate (CRYO), Factor VIII or Anti-Hemophilic Factor (AHF)		
12	Risks of Blood Transfusion Acute Hemolytic Reactions Causes, Clerical errors, Technical errors Delayed Haemolysis Non immune-mediated hemolysis Bacterial Contamination Bacterial Sources Bacterial Contamination, Lab. management	Most common causes of transfusion related deaths Acute Haemolytic Reactions Management Blood Bank Work-up culture of the blood pack	12th	2
13	Febrile non-haemolytic reactions - FNHRT Allergic Transfusion Reactions Anaphylaxis Laboratory management of anaphylaxis and allergic transfusion reactions	Risks of Transfusion - Infectious disease Allergic (Urticarial-Hives) - Transfusion Reactions Prevention of TA-GVHD Iron overload) Metabolic abnormalities Hypothermia	13th	2
14	Transfusion associated graft-versus-host disease - (TA-GVHD) Transfusion Associated Circulatory Overload (TACO) Transfusion Reaction Follow-up		14th	2
15	Final exam		15th	2
Total number of weeks and hours			15	30

Second: Practical/Tutorial/Clinical Aspects			
No.	**Practical/Tutorial/Clinical topics**	**No. of Weeks**	**Contact Hours**
1	Blood bank introduction, What is blood bank What is blood banking centre, Blood banking instrument's anticoagulants in the blood banking, blood banking reagents	2nd	2

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2	Preparation of washed red cell suspensions (3-5% and 20-30%)	3rd	2
3	ABO blood group reagents, ABO blood group -*Antigens and antibodies* ABO Typing, Forward blood typing, Reverse blood typing ABO subgrouping types, Importance Identification ABO discrepancies, Bombay group	4th ,5th	4
4	Lctins,, lectins used in Blood Bank, Lectin-Reactions Rh Blood Group System, Anti D reagent Rh antibodies , Laboratory detection, Antibodies types produced against Rh antigens , Rh antibodies importance, Rh- Possible genotypes, Paternity Testing	6th	2
5	**Type and Screen (T&S)** **Type and cross (T&S)** Antibody Screen– Screen for irregular antibodies	7th ,8th	4
6-7	**Compatibility Testing or "crossmatch** 1-**Immediate spin (IS) cross-match** --٢ **Full cross match**: (or Coombs Crossmatch): **3 -Electronic crossmatch (Computer cross match**	9th,10th	4
8	Blood transfusion managements Hemolytic reaction, Steps, How reported **Labs tests must be done for Acute hemolytic transfusion reactions (HTR)**	11th	2
9	**Labs tests must be done for Bacterial Contamination** and How reported	12th	2
10	New technology in blood banking Automated blood apheresis, Blood components irradiation	13th	2
11	Final practical exam	14th	2
Total number of weeks and hours		**13**	**26**

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