Student Number ……

Bachelor of Medical Laboratory Science

Blood Bank SLS 201 Final Examination

November-December 2015 Time: 0900hrs-1200hrs

First Semester Second Year

1. The Senior Medical Laboratory Scientist at Rusape General Hospital has just received red blood cells and their respective separated plasma for patients Amy, Bit, and Okra from the antenatal clinic obstetrics and gynaecologist, Dr Fain. Dr Fain has requested for ABO, Rh and antibody screen for the patients Amy, Bit and Okra.

    a. Perform the immunohaematological tests requested by Dr. Fain. Record your results on the tables provided in the Standard Operating Procedures (SOPs). [84]

    b. Were there any discrepancies in your results? If so, how do you explain? [6]

    c. If Dr. Fain had requested for a red blood cell transfusion for these patients, which compatible units would you select and why? [10]

STANDARD OPERATING PROCEDURES

Blood Bank SLS 201 Standard Operating Procedure

Procedure name: Antibody Screen / detection method

1. Label 2 tubes SI, SII and Acc
2. Put 2 drops of patient's serum in each of the tubes in step 1 above.
3. Add 1 drop of 2-5 % Screen cells: SI into tube labelled SI and SII into tube labelled SII.
4. Centrifuge at 3000 rpm for 15 seconds, check for haemolysis /agglutination. Record results in ***Table 1***
5. If negative in step 4 above, add 2 drops of LISS
6. Incubate for 15 minutes at 37° C
7. Centrifuge at 3000 rpm for 15 seconds, check for haemolysis/agglutination. Record results in ***Table 1.*** Proceed to step 8 if results are negative in step 7.
8. Wash the cells three times with normal saline
9. Add 2 drops of polyspecific AHG serum to washed cells
10. Centrifuge at 3000 revolutions per minute (pm) for 15 seconds
11. Read and record your results in ***Table 1***
12. If negative, add OSC
13. Centrifuge at 1 000 rpm for 30 seconds and read visually. Record results in ***Table 1***

Table 1: Antibody screen results

Patient / Sample	SI					SII					Antibody screen test Result	Comment
	RT-IS	LISS 37ºC	AHG	OSC	ACC	RT-IS	LISS 37ºC	AHG	OSC	ACC		

Procedure name: ABO Blood Grouping

Procedure Number	**: SLS 201**	**002**
Author	**:**	**Mutenherwa Menard**
Author's Title	**:**	**Lecturer**

Effective Date: 9th September 2015 **Copy No. 1**

APPROVALS

Name	Position	Signature	Date
W. Mushonga	Coordinator Laboratory Training		

1.0	**Purpose of procedure**	To detail steps to be followed when performing ABO blood grouping
2.0	**Scope**	All blood bank practical
3.0	**Definitions**	ABO blood grouping: Determining the antigens on the red blood cell and corresponding antibodies in the serum or plasma
4.0	**Applicable to**	All blood bank students and staff
5.0	**Equipment and reagents**	Anti sera (A, B, AB, D), Centrifuge, Blood bank saline, small tubes (khan tubes) preferably glass, beaker, plastic pipettes, tube holding rack
6.0	**QC procedures**	a. Quality control of all blood bank reagents b. Auto-control
7.0	**Safety precautions**	a. Treat all samples and chemicals as potentially harmful and infectious. b. All persons in the laboratory must put on laboratory coats, hand gloves, protective face masks, protective eye glasses c. Open shoes and long loose hair is prohibited when working in the laboratory d. Treat any spills of biological material and chemicals as potentially infectious and harmful e. Clean any spills according to the local authority procedure for handling spills in the laboratory f. Report ALL injuries sustained in the laboratory to the

		lecturer / practical demonstrator and record in the incident / accident record book.
8.0	**Records**	ABO Blood grouping record sheet

Type of records	**Retention Period**	**Storage Place**
ABO Blood grouping record sheet	4 years	Each student file
9.0 References	**References** 1. Cheesbrough M, 2000, District Laboratory Practice in Tropical Countries Part 2. Low Priced Edition. Cambridge University Press. 2. Roback J D et al, 2008, Technical Manual. 16th edition. AABB 3. Turgeon M L; 1995. Fundamentals of Immunohematology. 2nd edition. Williams and Wilkins.	

10.0 ABO Blood Grouping

1	Label 3 tubes as follows: • Tube 1-alpha or anti-A • Tube 2- beta or anti-B • Tube 3- alpha-beta or anti-AB
2	Add 2 drops of anti-A, anti-B and anti-AB to each of the labelled tubes in step **1** above (front group).
3	Add 1 drops of 2-5% (0.2ml/10ml -0.5ml/10ml) cell suspension to each tube containing anti-A, anti-B and anti-AB.
4	Label 3 more tubes: • Tube 4- A cells • Tube 5- B cells • Tube 6-Auto control cells
5	Add two drops of donor or patient serum to each tube labelled A cells, B cells and Auto control cells.

6	Add one drop of the respective blood grouping cells to tubes labelled A cells, B cells and Auto control cells.
7	Mix contents of the tubes by gently tapping the base of each tube with your finger
8	Leave all the 6 tubes at approximately 25°C for 5 minutes
9	Centrifuge at 3 000 revolutions per minute for 15 seconds
11	Take out the 6 tubes from the centrifuge and place them in the rack in same positions as before centrifuging
12	Read results macroscopically by tapping gently the base of each tube, looking for either agglutination or haemolysis. Grade as shown in table 4
13	Record results in the ABO Blood Group Record Sheet (Table 2) as follows: a. positive (+) if there is agglutination or haemolysis b. negative (-) if there is no agglutination or haemolysis c. Weak positive (+w)
14	Read microscopically for tubes where agglutination or haemolysis is seen as follows: Pipette 1 drop of sample from the negative tube and placing the drop on a clean glass slide Put cover slip Read using x10 or x20 microscope objective lens
15	Interpret results as shown on Table 3.

REVISION LOG

Number	**Date**	**Summary of Editions**
SLS 201 002	9 September 2015	New SOP

Appendices

Table 2: ABO Blood group Record Sheet

Patient / Sample identification	Tube 1 Anti-A	Tube 2 Anti-B	Tube 3 Anti-AB	Tube 4 A_1 cells	Tube 5 B cells	Tube 6 Auto control cells	ABO blood group

Table 3: Interpretation of ABO Blood grouping results

Tube 1 Anti-A	Tube 2 Anti-B	Tube 3 Anti-AB	Tube 4 A_1 cells	Tube 5 B cells	Tube 6 Auto control cells	ABO blood group
+	-	+	-	+	-	A
-	+	+	+	-	-	B
+	+	+	-	-	-	AB
-	-	-	+	+	-	O

Table 4: Grading Agglutination reactions

Grade	**Description**		
	erythrocyte aggregates	**erythrocytes**	**Supernatant**
Negative	None	free floating	
Mixed field	Few isolated	mostly free-floating	red
Weak	Tiny and barely visible macroscopically	many free	turbid and reddish
1+	few small just visible macroscopically	many free	turbid and reddish
2+	Medium size	some free	Clear
3+	Several large	some free	clear supernatant
4+	All combined into one solid		clear

Procedure name: Rh Typing method

1. Label two tubes, D and Alb
2. Add two drops of anti-D and two drops 22% Bovine albumin to tubes labelled D and Alb respectively.
3. Add one drop of 3% red blood cells suspended in saline to both tubes.
4. Centrifuge at 3000 revolutions per minute for 15 seconds and read macroscopically and microscopically if negative.
5. If negative, test for Weak Rh D by performing steps 5 to 13 of the A**ntibody screen method.**
6. **Record ALL results in Table 5 below**

Table 5: Rh Blood Group Results

Patient / Sample	**Anti-D**	**22% Bovine Albumin**	**Rh group**	**Comment**

Key to abbreviations and other terms

Abbreviation	Meaning
ACC	Auto-control for Coombs test
AHG	Anti-human globulin reagent sera
LISS	Low ionic strength solution
Negative	No haemolysis / agglutination seen
OSC	Group O Rh positive IgG sensitised red blood cells
Positive	Haemolysis / agglutination seen
Rpm	Revolutions per minute
RT-IS	Room temperature immediate spin
SI	Selectogen I antibody screen cells
SII	Selectogen II antibody screen cells