

POSTGRADUATE INSTITUTE OF MEDICINE
UNIVERSITY OF COLOMBO

MD (TRANSFUSION MEDICINE) EXAMINATION – AUGUST 2023

Date:- 14th August 2023

Time:- 1.00 p.m. – 4.00 p.m.

PAPER I

Answer **all five (05)** questions.

Answer each question in a separate book.

1. A 2-week-old, 2.4 kg baby underwent emergency surgery for pulmonary lacerations following trauma. Patient experienced a massive blood loss and an emergency request for red cell concentration (RCC) was placed after depletion of reserved stock for neonatal use, as the baby continued to bleed. In response to the emergency request, a 32-day old RCC was issued for transfusion and after about 60 mL of this unit being rapidly transfused through a central line, baby developed a cardiac arrhythmia and arrested.

All the RCC units transfused were compatible with both baby and the mother and was suspended in CPDA-1.

- 1.1. Discuss the most probable cause of cardiac arrhythmia and arrest in this baby. (40 marks)
- 1.2. Describe the potential mitigation strategies to reduce the type of adverse event you mentioned in 1.1. (30 marks)
- 1.3. Define ‘red cell storage lesion’ and briefly discuss the characteristic changes. (30 marks)
- 2.
- 2.1. Define “perioperative blood management programme”. (10 marks)
- 2.2. What are the key principles of patient blood management? (30 marks)
- 2.3. How do you help to establish a programme for assessment and management of preoperative anaemia in your hospital? (40 marks)
- 2.4. Comment on the phrase “red cell transfusion should not be dictated by a haemoglobin trigger alone”. (20 marks)

3.

3.1. Briefly describe the antigens on platelets and their clinical significance. (40 marks)

3.2. List the methods available for detecting platelet antigens and antibodies. (20 marks)

3.3. You are called for a multidisciplinary team meeting on a woman in her second pregnancy with 16 weeks of period of gestation.

Two years back she delivered her first baby and the baby developed intracranial haemorrhage after birth with a platelet count of $20 \times 10^9/L$.

Investigations revealed that the mother had anti-HPA 1a antibody.

Discuss the management options for the current pregnancy. (40 marks)

4.

4.1. Give a brief account on pathogenesis of hereditary spherocytosis. (40 marks)

4.2. A 4-year-old girl, diagnosed patient with hereditary spherocytosis, on regular clinic follow up, presents to the emergency unit with fever and shortness of breath for 2 days.

On examination she was febrile, icteric with an enlarged spleen.

Her full blood count:

Hb	5 g/dL	(12- 16.5)
WBC	$12.5 \times 10^9/L$	(4-11)
Platelet count	$135 \times 10^9/L$	(150-400)

4.2.1. State five (05) investigations that are indicated on this patient. (15 marks)

4.2.2. Outline the acute management of this patient. (15 marks)

4.2.3. Briefly describe the principles of long term management of this patient. (30 marks)

5. A 16-year-old girl was admitted to a tertiary care hospital with severe pneumonia. As her pneumonia status was not resolved for one month with vigorous antibiotic treatment, her treating physician suspected of an immune deficiency status.

She has a history of Dengue haemorrhagic fever 4 years back and blood products were given. With further investigations, her HIV positivity was confirmed. Sexual and other routes of HIV transmission except transfusion transmission were confidentially excluded.

You were informed by the treating physician to investigate this incident.

- 5.1. As the Transfusion Physician of this hospital, discuss the actions you would take regarding this incident. (60 marks)
- 5.2. Briefly discuss the following:
- 5.2.1. Advantages of Enzyme Linked Immuno Sorbent Assay (ELISA). (20 marks)
- 5.2.2. Disadvantages of Particle Agglutination Assay (PA). (20 marks)

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MD (TRANSFUSION MEDICINE) EXAMINATION – AUGUST 2023

Date:- 15th August 2023

Time:- 1.00 p.m. – 4.00 p.m.

PAPER II

Answer **all five (05)** questions.

Answer each question in a separate book.

1. Sri Lanka is a country with a 100% voluntary blood donation system, and also a World Health Organization (WHO) collaboration centre. Therefore, WHO has requested you to arrange an awareness program on establishment of effective voluntary blood donation system for a country where such a system is not available.

A team from that country is planning to visit Sri Lanka.

1.1. Describe the important aspects you would consider, in organizing such a program. (60 marks)

1.2. Iron deficiency may occur among regular blood donors.

1.2.1. How do you explain iron deficiency among blood donors? (20 marks)

1.2.2. How would you prevent iron deficiency among blood donors? (20 marks)

2.

2.1. A 55-year-old man attending the medical day care unit for two units of red cell transfusions as part of his supportive care for aplastic anaemia. Fifteen minutes into the first unit he calls the nurse over as he feels unwell. He complains of back pain and nausea.

Bed side observations are taken: Respiratory rate 20/minute, temperature 39°C, heart rate 100 beats/minute, blood pressure 95/70 mmHg.

Describe your management and investigation of this scenario, with reference to your diagnosis/differential diagnoses. (60 marks)

2.2. You are asked to investigate a near miss incident.

A group and screen sample from a patient on the surgical day unit has been typed as group A Rh D positive, but the historical blood bank record is group B Rh D positive.

Discuss how would you address this discrepancy. (40 marks)

3. A young man with acute myeloid leukaemia in first complete remission received consolidation chemotherapy with cytosine arabinoside and mitoxantrone. He was treated in a single room with filtered air. On D+6 after finishing chemotherapy, he became febrile (38.5°C). The absolute neutrophil count was $0.53 \times 10^9/L$. Chest x-ray was reported as clear. Piperacillin and amikacin were administered. Bacteriological cultures of blood, throat and urine were negative. On D+9 fever reached 39.2°C and Vancomycin was added. Absolute neutrophil count was $0.12 \times 10^9/L$, Hb 9.8 g/dL, platelet count $16 \times 10^9/L$. Forty-eight hours later he was still febrile. Blood, stool, urine cultures were negative for fungi. Meropenem and Amphotericin were substituted for amikacin/piperacillin.

On D+12 the patient is tachypnoeic, oxygen saturation on breathing ambient air is 90%. Neutrophil count is $0.02 \times 10^9/L$, Nucleic acid testing for cytomegalovirus, respiratory syncytial virus, influenza and para influenza viruses were negative. Computerized tomography scan of the chest revealed small round opacities in the middle and lower lobe of the right lung.

- 3.1. Would you consider granulocyte transfusion for this patient? Give reasons. (20 marks)
- 3.2. How would you select granulocyte donors? (30 marks)
- 3.3. Describe the donor preparation for granulocyte collection. (30 marks)
- 3.4. Give a brief account on complications of granulocyte transfusion. (20 marks)

4. You are consultant in charge of a blood bank. You have obtained a new automated blood bank analyzer using column agglutination technology for performing ABO and Rh blood group and antibody screening.

- 4.1. Describe the validation that you will perform prior to implementation of the new instrument. (40 marks)
- 4.2. Describe the quality control plan to ensure reliable results. (30 marks)
- 4.3. Describe the areas of risk assessment to ensure reliable results. (30 marks)

5.

- 5.1. A 12-year-old diagnosed patient with chronic liver cell disease (CLCD) due to auto immune hepatitis is having CHILD B decompensated cirrhosis with ascites. He has a recent history of upper gastrointestinal bleeding and banding done. He is on transplant workup and admitted with worsening jaundice and hepatic encephalopathy. Urine output is currently normal.

Following a multidisciplinary team meeting, it was decided to start plasma exchange as bridging therapy. Consultant transfusion physician advised to arrange a central line to start the procedure on the same day afternoon.

Blood bank received a request for 10 ml/kg fresh frozen plasma and an adult dose of platelets for optimization prior to central line insertion.

Hb	8.5 g/dL	(13 - 18)
Platelet count	50 x 10 ⁹ /L	(150 - 450)
PCV	25.7%	(38.3 - 48.6)
Serum sodium	134 mEq/L	(135 - 145)
Serum potassium	4.2 mEq/L	(3.5 - 5.5)
Serum calcium	2.1 mg/dL	(8.6 - 10.3)
INR	2.1	
APTT	51.6 sec.	(32 - 42)
Total bilirubin	423 µmol/L	(5 - 19)
Direct bilirubin	298 µmol/L	(0 - 5)

How do you respond to this request and give reasons. (40 marks)

- 5.2. You are appointed to a tertiary care hospital as consultant transfusion physician and observe that the patients referred for plasma exchange are transferred due to lack of facilities.

You are planning to develop therapeutic apheresis service for your hospital.

Discuss the specific aspects you would consider in implementing this service. (60 marks)