MASTER COPY

POSTGRADUATE INSTITUTE OF MEDICINE
UNIVERSITY OF COLOMBO

SELECTION EXAMINATION FOR MD (EMERGENCYMEDICINE)
DECEMBE 2024

Date:- 20th December 2024 **Time:-** 9.00 a.m. - 12.00 noon

ESSAY PAPER

Answer **all six (06) questions.**
Answer each question in a separate book.

1.

1.1. A 35-year-old woman is admitted to the emergency department following a runover injury. Her blood pressure is 90/60 mmHg and the pulse rate is 100 beats/minute. There is a contusion over the right lower rib cage and loin area. The abdominal examination revealed evidence of peritonitis. FAST scan shows laceration of the diaphragmatic surface of the right lobe of liver, and moderate amount of fluid in the pouch of Douglas. Chest x-ray shows fracture of right 8 - 10 ribs. She underwent laparotomy through a midline incision.

1.1.1. State three (03) other possible organs to be injured in this patient according to the site of the impact. (15 marks)

1.1.2. Outline the pathway of blood tracking from the injured liver to the pouch of Douglas within the peritoneal cavity. (10 marks)

1.1.3. State the tissue layers that you will go through during the midline incision. (10 marks)

1.1.4. Name the peritoneal ligaments attached to the liver and state the site of attachment to the liver. (20 marks)

1.1.5. State five (05) visceral organs that is in contact with the right lobe of liver. (10 marks)

Contd...../2-

1.2. A 50-year-old man with longstanding hypertension is admitted to the emergency department with headache and body weakness. Investigations revealed ischaemic changes of the brain in the territory of the area supplied by the right middle cerebral artery.

1.2.1. State the area of the brain that shows ischaemic changes. (10 marks)

1.2.2. State three (03) possible neurological defects you may observe in this patient. (10 marks)

1.2.3. Draw a labeled diagram of the circle of Willis. (15 marks)

2. A 45-year-old woman was admitted after collapsing when she arrived at work early morning. On admission she was conscious and complained that she had generalized weakness, weight loss and increased skin pigmentation for 6 months. She was afebrile, pulse rate was 130 beats/minute and blood pressure was 100/70 mmHg supine and 80/50 mmHg upright.

Investigations revealed:

Serum sodium	135 mmol/L	(135-144)
Serum potassium	5.6 mmol/L	(3.5-5)
Random blood glucose	60 mg/dL	

2.1. What is the most likely endocrine cause for her presentations? (10 marks)

2.2. Explain the pathophysiological basis of

2.2.1. increased skin pigmentation (15 marks)

2.2.2. blood pressure readings (25 marks)

2.2.3. serum potassium of 5.6 mmol/L (10 marks)

2.2.4. random blood glucose of 60 mg/dL (20 marks)

2.3. Outline the physiological basis of

2.3.1. further urgent investigations required for the diagnosis of the acute presentation. (10 marks)

2.3.2. the principals of emergency management. (10 marks)

Contd...../3-

3. A 45-year-old man has multiple fractures of the lower limbs following a road traffic accident. He complains of excruciating pain and back ache. The attending doctor decides to give morphine for pain relief.

3.1. What is the mechanism of action of opioids? (20 marks)

3.2. List five (05) routes that morphine can be administered to this patient. (10 marks)

3.3. Name two (02) of the principles you would follow to safely achieve effective pain relief. (20 marks)

3.4. What is the most feared side effect of opioid administration? (05 marks)

3.5. Name two (02) conditions that increase the risk of the above-mentioned side effect. (20 marks)

The patient is discharged following surgery. On post operative follow up the patient complains of pain running down his left leg. The MRI reveals lumbar canal stenosis.

3.6. Name three (03) medications to relieve this pain. (15 marks)

3.7. Name two (02) non pharmacological aspects of pain management in this patient. (10 marks)

4. Explain the pathophysiological basis of the following:

4.1. Long term hospitalization is a risk factor for death due to pulmonary embolism. (25 marks)

4.2. Melaena is seen in patients with a history of heavy alcohol consumption. (25 marks)

4.3. Early thrombolysis following acute ischaemic stroke is associated with better outcomes. (25 marks)

4.4. A man develops acute kidney injury three days after a road traffic accident from which he suffered severe crush injuries to his lower limbs. His urine is 'tea coloured' and laboratory tests showed increased levels of plasma creatinine kinase and increased urinary myoglobulin. (25 marks)

Contd...../4-

5.

5.1. State the main components of an intra-arterial blood pressure (IABP) measuring system with reasoning. (40 marks)

5.2. Outline the physical principles of IABP monitoring. (30 marks)

5.3. Describe what information can be obtained from an arterial pressure waveform with the aid of a diagram. (30 marks)

6. A 25-year-old woman was brought to the hospital in a confused state. She has been on treatment for a UTI during last 5 days. On examination the patient was febrile, dehydrated and breathing rapidly. Rapid bedside test for glucose was strongly positive.

Results on blood tests performed by the clinical laboratory are shown below:

Blood glucose	414 mg/dL	
Blood urea	27 mg/dL	(5- 20)
Serum creatinine	0.9 mg/dL	(0.7 -1.2))
Serum sodium	130 mmol/L	(135 -145)
Serum potassium	5.7 mmol/L	(3.5 - 5.1)
Serum chloride	92 mmol/L	(90 -102)
pH	7.2	
HCO_3^-	12 mmol/L	(22 - 29)
pCO_2	35 mmHg	(35 - 45)
Urine ketone bodies	Positive	

6.1. Interpret the results of arterial blood gas analysis. (25 marks)

6.2. Briefly mention one (01) pathophysiological mechanism each for abnormalities in sodium, potassium and urea levels. (25 marks)

6.3. Outline the principles of acute management of this patient. (30 marks)

6.4. Briefly indicate the long-term management of this patient. (20 marks)