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POSTGRADUATE INSTITUTE OF MEDICINE
UNIVERSITY OF COLOMBO

MD (PAEDIATRICS) EXAMINATION JULY, 2014

Date : 22nd July 2014 **Time:** 9.00 a.m. – 12.00 noon

PAPER I
(STRUCTURED ESSAY QUESTIONS)

Answer **all five** questions.
Answer each question in a **separate book.**

Q.1.

1.1 Define drowning. (10 marks)

1.2 Describe briefly the patho-physiological changes that occur in lungs and central nervous system in drowning. (40 marks)

1.3 Discuss the principles of management of a child brought to the Emergency Treatment Unit with drowning. (40 marks)

1.4 List four (04) poor prognostic indicators of drowning. (10 marks)

Q.2.

2.1 What is Toxic Shock Syndrome? (20 marks)

2.2 Mention the clinical criteria used in the diagnosis of Toxic Shock Syndrome. (30 marks)

2.3 Briefly describe the patho-physiological mechanism leading to Toxic Shock Syndrome. (20 marks)

2.4 Outline the management of Toxic Shock Syndrome. (30 marks)

Contd...../2-

Q.3.

3.1 Mention **five early** and **five long term** complications that may occur in a baby who was born at 28 weeks of gestation. (20 marks)

3.2 List two (02) preventive actions you would undertake for each of the **early** onset complications you have mentioned in 3.1. (40 marks)

3.3 What are the precautions that should be taken during transport of a sick neonate to the Regional Neonatal Intensive Care Unit? (40 marks)

Q.4.

4.1 What is the classification of Allergic Rhinitis in children? (10 marks)

4.2 What are the prerequisites for expression of Allergic Rhinitis? (10 marks)

4.3 Describe the pathogenesis of Allergic Rhinitis in children. (30 marks)

4.4 List five (05) symptoms and five (05) signs of Allergic Rhinitis. (20 marks)

4.5 What are the pharmacological modalities available for treatment of Allergic Rhinitis? (30 marks)

Q.5.

5.1 What is a clinical trial? (20 marks)

5.2 Briefly explain the phases of a clinical trial prior to introducing a new antibiotic for human use. (50 marks)

5.3 What are the expected objectives of each phase of a clinical trial? (30 marks)

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PAPER II - CASE HISTORIES

Answer **all five** questions.
Answer each question in a **separate book.**

1. A five (5) year old boy is admitted with a four day history of high intermittent fever, cough and shortness of breath.

   He had developed a similar episode three weeks prior to this illness which had needed hospitalization and was discharged after five days of intravenous antibiotics. Since then he has had a cough and a mild wheeze for which he is on oral medications.

   Four days prior to the present admission, his cough and wheeze became progressively worse and he developed high fever and shortness of breath.

   He has had four previous hospital admissions. All of them were for lower respiratory tract infections. The first episode developed at the age of two years. All these admissions had required nebulization with bronchodilators and antibiotic therapy. He had been commenced on inhaler therapy at the age of four years by the General Practitioner (GP) due to frequent episodes of respiratory tract infections and wheeze. Despite this, his mother had to take him to the GP once a month to take treatment for cough and wheeze. He has also had three episodes of otitis media during the first two years of life. He is the 1st born child of healthy parents. He had been vaccinated according to the National Immunization Programme of Sri Lanka.

   On examination he is febrile, ill looking and irritable. He has evidence of some dehydration. His weight is well below the 3rd percentile and height is at the 3rd percentile. The pulse is 120/minute and is of good volume and blood pressure is 90/60 mm Hg. He has early clubbing.

   Respiratory examination reveals pectus carinatum, Harrison sulci and hyperinflated lungs. He has intercostal and subcostal recessions with reduced air entry in the right middle and left lower zones. There are diffuse rhonchi in both lung fields with coarse crepitations in the right middle and left lower zones.

Contd..../2-

Results of the following investigations are available;

Haemoglobin	10 g/dL (11-13.5)
WBC/DC	$15.4x10^9$/L, (6-11 $x10^9$) N – 88%, L – 12%
Platelet count	$450x10^9$/L (150-400 $x10^9$)
ESR	80 mm/1st hour (<20)
Chest x-ray	Patchy consolidation in right middle and left lower lobes
Mantoux test	5 mm induration
Mycoplasma IgM	Negative

1.1 What is the complete diagnosis of the respiratory condition? (20 marks)

1.2 List five (05) possible underlying disease conditions that could have led to the diagnosis mentioned in 1.1. (30 marks)

1.3 List the investigations you would request, giving reasons, to arrive at a diagnosis of the underlying disease conditions stated in 1.2. (30 marks)

1.4 List two (02) likely reasons why the inhaler therapy has failed in this child. (20 marks)

Contd…/3-

2. A three year old girl was admitted for evaluation of anaemia resistant to iron therapy. She is the 4th child of this family from the North Central Province of Sri Lanka. Mother is a housewife educated up to grade 9. Father educated up to grade 5, is engaged in fresh water fishing and cattle farming to support the family.

A diagnosis of iron deficiency anaemia was established one month ago when she presented with a history of abdominal pain, pica and irritability.

Examination had revealed a pale child with poor growth with no other physical signs except for faecal masses felt in the left iliac fossa. The attending doctor from the out patient department had prescribed iron syrup 5 ml twice a day, vitamin B complex tablets and folic acid tablets. The initial complete blood count prior to treatment was as follows:

Haemoglobin	6.9 g/dL (11-12.5)
WBC/DC	7.4 x 10^9/L - N- 35 %, L 58 %, E 7%
Platelet count	210 x 10^9/L (210-490x10^9)
RBC count	3.6 x 10^{12}/L (3.9-5.0x10^{12})
MCV-68 fl (73-79),	MCH - 23 pg (28-30),
	MCHC - 30 g/dL (32-36)

At this presentation (one month later) the child is pale, not icteric and has a 1 cm liver and a just palpable spleen. There are no signs of vitamin deficiencies. Parents are distant relatives. Further inquiry revealed a family history of thalassaemia.

The following are investigations done at this visit on this child:

<u>Complete blood count</u>

Haemoglobin	7.2 g/dL	(11-12.5)
WBC/DC	6.5 x 10^9/ L - N 44 %, L 50 %, E 6%	
Platelet count	228 x 10^9/L	(210-490x10^9)
RBC count	4.6 x 10^9/L	
MCV - 71 fl (73-79),	MCH 24 pg (28-30),	MCHC 35 g/dL (32-36)

Reticulocytes count	4 %	(< 2 %)
Serum bilirubin	15 µmol/L	(3-20)
ALT	28 U/L	(< 40)
AST	35 U/L	(<40)
ESR	45 mm/1st hour	(< 20)
C reactive protein	4 mg/dL	(< 6)
Serum creatinine	0.8 mg/dl	(0.2 – 0.9)

Contd..../4-

Complete blood count of the mother:

Haemoglobin	8.5 g/dL	(12-15)
WBC/DC	9.5 x 10^9/ L - N- 55%, L 40%, E5%	
Platelet count	220 x 10^9/L	(180-430x10^9)
RBC count	3.8 x 10^{12}/L	(4.1-5.1x10^{12})

MCV- 72 fl (80-90), MCH 22 pg (27-30), MCHC 28 g/dL (32-35)

Complete blood count of the father:

Haemoglobin	11.8 g/dL	(12-16)
WBC/DC	5.2 x 10^9/ L - N- 50%, L 46%, E 4%	
Platelet count	220 x 10^9/L	(180-430x10^9)
RBC count	5.6 x 10^{12}/L	(4.1-5.1x10^{12})

MCV- 65fl (80-90), MCH 20pg (27-30), MCHC 32g/dL (32-35)

2.1 Name five (05) other actions that would have been appropriate at the first visit. (30 marks)

2.2 What is the most likely diagnosis in this child? (20 marks)

2.3 Name two (02) other investigations with the interpretations that will support the diagnosis. (20 marks)

2.4 What additional advice would you give this family? (30 marks)

Contd...../5-

3. A five (5) month old baby is admitted in the night with difficulty in breathing to a peripheral hospital with only basic paediatric facilities. He had a cough and tachypnoea for one week which was progressively worsening in spite of treatment taken from a General Practitioner.

He is the first born child of a 20 year old mother from a low income family. He was born at term following normal vaginal delivery with a birth weight of 3.0 kg and the post natal period was uneventful. Breast feeding was established before discharge. On neonatal examination the baby was found to have a soft ejection systolic murmur in the pulmonary area and was asked to come to the clinic in two weeks. Mother did not come for review as the baby had no problems and feeding was satisfactory.

At two months and four months his weights were 3.6 and 4.5 kg respectively. Mother had added formula feeds at two months as the baby was taking a long time to complete a breast feed.

On admission he was tachypnoeic with inter-costal and sub-costal recessions and there was cyanosis. Respiratory rate was 60/minute and the heart rate was 168/minute with a low volume pulse. Blood pressure was 50/30 mmHg and there was a gallop rhythm. The liver was palpable 5cm below the right costal margin. Oxygen saturation was 80%

3.1 What is your immediate ward management of this child? (20 marks)

With your management there was some clinical improvement but the oxygen saturation remained around 85%. On examination there was an ejection systolic murmur over the pulmonary area.

Chest x-ray	Cardiomegaly with plethoric lung fields
ECG	QRS axis 120^0 and prominent P waves
Haemoglobin	14g/dL (11-12.5)
Haematocrit	42%
WBC/DC	$10x10^9$/L N 50%, L 45%, M 4%, E 1%
Platelet count	$200x10^9$/L ($150-400 x10^9$)
C reactive protein	12 mg/dL (<6)

3.2 Explain the most likely pathophysiological basis for this clinical presentation. (20 marks)

3.3 Outline the further management in the next 24 hours. (30 marks)

3.4 Give the principles of long term management of the child. (30 marks)

Contd...../6-

4. Nine year old Araliya is brought by her parents, as her class teacher had been concerned about her. She had always been the shortest in her class but was a well adjusted, friendly girl and reasonably good in her studies. Over the past few months her teacher had noticed a gradual but steady decline in her school performance and also noted that she was withdrawn.

She is the only child of non-consanguineous parents. Apart from the usual childhood illnesses and recurrent otitis media needing insertion of grommets, she had been a healthy girl. She had a good appetite and her bowel habits were normal. There was no history suggestive of urinary tract infections. The parents had also noticed that she was quiet and withdrawn over the previous few months but had repeatedly denied any 'problem' when questioned.

Examination finds a friendly, corporative, prepubertal child whose height is 112 cm (well below the 3rd percentile) and weight is 24 kg (10th - 25th percentile). There is a significant systolic murmur at the base of the heart and her blood pressure is 100/60 mm Hg. Her mother's height is 159 cm (25th percentile) and father's height is 168cm (10th percentile).

During the examination she confessed to being bullied at school because she was short.

Her investigations are as follows :

Haemoglobin	12 g/dl	(12-14)
Blood urea	20 mg/dl	(15 – 40)
Serum electrolytes		
	Na^+ - 138 mEq/L	(135 – 145)
	K^+ - 4.2 mEq/L	(3.5 – 5.6)
ESR	10 mm /1st hour	(<20)
Serum TSH	3.5 µIU/ml	(0.7 - 5.7)
Serum Free T_4	1.5 ng/dL	(0.8- 2.0)

4.1 Give two (02) possibilities for her short stature. (10 marks)

4.2 Give five (05) investigations to differentiate the two (02) conditions given in 4.1 with the expected findings in each condition. (40 marks)

4.3 What is the most likely clinical diagnosis? (10 marks)

4.4 Which is the investigation given in 4.2 that has relevance for her future prognosis? Give your reasons. (10 marks)

4.5 Describe the anticipated replacement therapies in her long-term management. (30 marks)

Contd...../7-

5. An eleven year old boy from Modara was referred for further investigation of progressive abdominal distension. He was seen by the General Practitioner (GP) during the past two months for multiple complaints. At the beginning he had recurrent abdominal pain which was dull and aching in nature. These episodes had lasted for 2-3 hours and settled spontaneously. He also had a chronic cough which was attributed to his smoking of illicit drugs and "beedi." The abdominal distension was first noted about one month prior to referral. His GP did not find any abnormality in the blood count and urine microscopy. He had occasional bouts of vomiting associated with cough. During the last few days the pain became crampy and distension became more prominent.

He is living with his maternal grandparents. According to his grandmother, both his parents were killed in violence when he was two years old. He dropped out from school at seven years of age and was involved with various activities to support the family. During last one year he was employed at a local shop. The grandmother suspects that the boy is involved in illegal drug trafficking and smoking "ganja".

On examination his height is 137 cm (25^{th} percentile) and the weight is 30 kg (3^{rd} percentile). He looks ill and emaciated. There is no lymphadenopathy. Examination of the cardiovascular system is normal and there is clinical evidence of a right sided pleural effusion. The abdomen is distended and non- tender. There is a significant amount of free fluid in the abdomen and no organomegaly is detected.

Investigations are as follows:

Haemoglobin	9.3 g/dL	(11-16)
WBC/DC	$8.2x10^9$/L,	N 30% L 70%
Platelet count	$487x10^9$/L	(150-400 $x10^9$)
ESR	60 mm/1^{st} hour	(<20)
C reactive protein	12 mg/dL	(<6)
Serum sodium	138 mEq/L	(134-145)
Serum potassium	4 mEq/L	(3.5-6.0)
Blood urea	5.6 mmol/L	(4-6)
ALT	44 IU/L	(20-40)
AST	38 IU/L	(20-40)
Blood picture	Red cells are normocytic and normochromic White cells and platelets are normal. No abnormal cells	

Ultrasound of the abdomen: free fluid in the abdomen. No masses in the liver or pancreas. Kidneys and supra renal glands were normal.

5.1 What is the most likely diagnosis? Give one other possible diagnosis. (20 marks)

5.2 List the investigations you would request to arrive at a definitive diagnosis. (20 marks)

5.3 Outline the medical management of the most likely diagnosis. (20 marks)

5.4 Give the principles of long term management of this child. (40 marks)