

POSTGRADUATE INSTITUTE OF MEDICINE
UNIVERSITY OF COLOMBO

MD (PAEDIATRICS) EXAMINATION – JULY 2015

Date :- 21st July 2015

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. Discuss briefly the factors responsible for iron overload in transfusion dependent thalassaemia (TDT) and non transfusion dependent thalassaemia (NTDT). (20 marks)
- 1.2. Outline the management of cardiac complications of thalassaemia major including the interventions that are carried out to prevent these complications. (30 marks)
- 1.3. Mention briefly the novel approaches which are under trial for the treatment of thalassaemia. (20 marks)
- 1.4. Discuss briefly the ways to improve the quality of life of thalassaemia major patients. (30 marks)

Q.2.

- 2.1. What is neonatal screening? (30 marks)
- 2.2. Discuss the routine neonatal screening programmes which are being carried out in Sri Lanka, including those due to be introduced in the near future. (30 marks)
- 2.3. Briefly describe the methodology (protocol) of one neonatal screening programme recently introduced or due to be introduced soon, to the country. (20 marks)
- 2.4. Write a short note on screening for Retinopathy of Prematurity (ROP). (20 marks)

Contd...../2-

Q.3.

3.1. Describe briefly

3.1.1. the patho-physiological changes (15 marks)

3.1.2. clinical manifestations (15 marks)

of primary pulmonary tuberculosis.

3.2. Discuss the available investigations to confirm the diagnosis of pulmonary tuberculosis. (40 marks)

3.3. Outline the management of a neonate born to a mother with active pulmonary tuberculosis. (30 marks)

Q.4.

4.1. Define Adverse Events Following Immunization (AEFI). (10 marks)

4.2. Classify the Adverse Events Following Immunization (AEFI). (10 marks)

4.3. Enumerate the different steps that you would take in the period following the recovery of a child from an Adverse Event Following Immunization. (25 marks)

4.4. Briefly discuss the factors that need to be considered when a new vaccine is to be introduced to the National Programme of Immunization (NPI). (30 marks)

4.5. Outline the immunological benefits of a conjugate vaccine. (25 marks)

Q.5.

5.1. Outline the aetiological classification of cirrhosis and provide four (04) conditions for each category that you have outlined. (20 marks)

5.2. List five (05) complications of cirrhosis. (10 marks)

5.3. Outline the management of a cirrhotic child who presents with alimentary bleeding. (30 marks)

5.4. What are the available treatment options for patients with re-bleeding in a cirrhotic child? (15 marks)

5.5. When would you suspect the hepato-pulmonary syndrome in a child with chronic liver disease? (25 marks)

POSTGRADUATE INSTITUTE OF MEDICINE
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MD (PAEDIATRICS) EXAMINATION – JULY/AUGUST 2015

Date :- 22nd July 2015

Time :- 9.00 a.m. – 12.00 noon

PAPER II – CASE HISTORIES

Answer **all five** questions.

Answer each question in a **separate book**.

1. A 9 year old girl was admitted with one day history of acute watery diarrhoea and persistent vomiting. She was initially resuscitated with intravenous fluids. On Day 3 of admission she was found to be dyspnoeic at night and needed few pillows for her to be comfortable. Mother gives a history of child passing less amount of urine during this illness. The child has been complaining of headache for the last few days and loss of hair for few weeks. She has had a recent history of a “respiratory tract infection” which was treated by the General Practitioner. She is not on long term medications.

On examination, her Body Mass Index was > 95th percentile for the age (weight 40 kg; >97th percentile, height 130 cm; at 50th percentile) with acanthosis nigricans on the neck and axillae. She was dyspnoeic and afebrile. Her pulse rate was 120 per minute with a blood pressure of 140/95 mmHg. Apex beat was at the 5th intercostal space at mid-clavicular line and normal in character. Respiratory rate was 30 per minute and there were basal crepitations in both lung fields. The liver was palpable 1.5 cm and non-tender. Oxygen saturation with pulse oximeter was 92% in air.

1.1. Briefly discuss the treatment at this stage.

(20 marks)

Contd.../2-

Two days later she was noted to have bilateral pleural effusions which was progressively getting worse over the next few days. Her abdomen was distended but shifting dullness could not be elicited. Her blood pressure remained more than 125/80 mmHg throughout this period. Her urine ward test revealed 3+ of proteinuria for 6 consecutive days. (Percentile chart for blood pressure is attached.)

Following investigation results are available:

Urine full report	colourless	
protein	+++	
pus cells	5-8/hpf	
red cells	40-50/hpf	
hyaline casts	nil	
granular casts	++	
Urine protein: creatinine ratio	300 mg/mmol	(<50)
Blood urea	11 mmol/L	(4 - 6)
Serum sodium	140 mmol/L	(137-145)
Serum potassium	4.9 mmol/L	(3.5-5.1)
Serum creatinine	77 µmol/L	(26-65)
Serum proteins	63.5 g/L	(60-85)
albumin	29.2 g/L	(35-55)
globulin	34.3 g/L	(25-35)
ESR	80 mm in first hour	
C-reactive protein	2.7 mg/dL	(0-5)
Full blood count		
Haemoglobin	9.8 g/dL	
WBC	14200/mm ³	N - 80%, L-9%, M - 6%, E - 5%
Platelet count	150,000/mm ³	
Blood picture	Normocytic normochromic red cells with a population of hypochromic microcytic cells. No fragmented red cells. White cells appear normal. Platelets appear low in number.	
Fasting blood sugar	93 mg/dL	(75-115)
AST	17 U/L	(13-31)
ALT	20 U/L	(10-40)
ASOT	200 iu/ml	

Contd.../3-

Lipid profile		
Cholesterol	144 mg/dL	(125-205)
Triglycerides	80 mg/dL	(39-120)
HDL	31 mg/dL	(37-70)
VLDL	16 mg/dL	
LDL	97 mg/dL	(68-136)
Stool culture	Salmonella or Shigella species were not identified.	
Chest x-ray	performed on Day 3 of admission. There are diffuse patchy densities in a butterfly distribution in the lungs. Cardiac shadow is normal.	
Ultrasound abdomen	Liver and both kidneys show normal echogenicity. No ascites.	

- 1.2. State the most likely pathological phenomenon which led to this acute clinical presentation. (10 marks)
- 1.3. What is the most likely underlying aetiology for the child to develop the above clinical scenario? (10 marks)
- 1.4. Mention four (04) important investigations that would help you to manage this child. (20 marks)
- 1.5. Outline five (05) important aspects in the management of this child. (40 marks)

Contd...../4-

Blood Pressure Levels for Girls by Age and Height Percentile (Continued)

Age (Year)	BP Percentile ↓	Systolic BP (mmHg)							Diastolic BP (mmHg)						
		← Percentile of Height →							← Percentile of Height →						
		5th	10th	25th	50th	75th	90th	95th	5th	10th	25th	50th	75th	90th	95th
11	50th	100	101	102	103	105	106	107	60	60	60	61	62	63	63
	90th	114	114	116	117	118	119	120	74	74	74	75	76	77	77
	95th	118	118	119	121	122	123	124	78	78	78	79	80	81	81
	99th	125	125	126	128	129	130	131	85	85	86	87	87	88	89
12	50th	102	103	104	105	107	108	109	61	61	61	62	63	64	64
	90th	116	116	117	119	120	121	122	75	75	75	76	77	78	78
	95th	119	120	121	123	124	125	126	79	79	79	80	81	82	82
	99th	127	127	128	130	131	132	133	86	86	87	88	88	89	90
13	50th	104	105	106	107	109	110	110	62	62	62	63	64	65	65
	90th	117	118	119	121	122	123	124	76	76	76	77	78	79	79
	95th	121	122	123	124	126	127	128	80	80	80	81	82	83	83
	99th	128	129	130	132	133	134	135	87	87	88	89	89	90	91
14	50th	106	106	107	109	110	111	112	63	63	63	64	65	66	66
	90th	119	120	121	122	124	125	125	77	77	77	78	79	80	80
	95th	123	123	125	126	127	129	129	81	81	81	82	83	84	84
	99th	130	131	132	133	135	136	136	88	88	89	90	90	91	92
15	50th	107	108	109	110	111	113	113	64	64	64	65	66	67	67
	90th	120	121	122	123	125	126	127	78	78	78	79	80	81	81
	95th	124	125	126	127	129	130	131	82	82	82	83	84	85	85
	99th	131	132	133	134	136	137	138	89	89	90	91	91	92	93
16	50th	108	108	110	111	112	114	114	64	64	65	66	66	67	68
	90th	121	122	123	124	126	127	128	78	78	79	80	81	81	82
	95th	125	126	127	128	130	131	132	82	82	83	84	85	85	86
	99th	132	133	134	135	137	138	139	90	90	90	91	92	93	93
17	50th	108	109	110	111	113	114	115	64	65	65	66	67	67	68
	90th	122	122	123	125	126	127	128	78	79	79	80	81	81	82
	95th	125	126	127	129	130	131	132	82	83	83	84	85	85	86
	99th	133	133	134	136	137	138	139	90	90	91	91	92	93	93

BP, blood pressure

* The 90th percentile is 1.28 SD, 95th percentile is 1.645 SD, and the 99th percentile is 2.326 SD over the mean.

For research purposes, the standard deviations in Appendix Table B-1 allow one to compute BP Z-scores and percentiles for girls with height percentiles given in Table 4 (i.e., the 5th, 10th, 25th, 50th, 75th, 90th, and 95th percentiles). These height percentiles must be converted to height Z-scores given by (5% = -1.645; 10% = -1.28; 25% = -0.68; 50% = 0; 75% = 0.68; 90% = 1.28%; 95% = 1.645) and then computed according to the methodology in steps 2-4 described in Appendix B. For children with height percentiles other than these, follow steps 1-4 as described in Appendix B.

Blood Pressure Levels for Girls by Age and Height Percentile

Age (Year)	BP Percentile ↓	Systolic BP (mmHg)							Diastolic BP (mmHg)						
		← Percentile of Height →							← Percentile of Height →						
		5th	10th	25th	50th	75th	90th	95th	5th	10th	25th	50th	75th	90th	95th
1	50th	83	84	85	86	88	89	90	38	39	39	40	41	41	42
	90th	97	97	98	100	101	102	103	52	53	53	54	55	55	56
	95th	100	101	102	104	105	106	107	56	57	57	58	59	59	60
	99th	108	108	109	111	112	113	114	64	64	65	65	66	67	67
2	50th	85	85	87	88	89	91	91	43	44	44	45	46	46	47
	90th	98	99	100	101	103	104	105	57	58	58	59	60	61	61
	95th	102	103	104	105	107	108	109	61	62	62	63	64	65	65
	99th	109	110	111	112	114	115	116	69	69	70	70	71	72	72
3	50th	86	87	88	89	91	92	93	47	48	48	49	50	50	51
	90th	100	100	102	103	104	106	106	61	62	62	63	64	64	65
	95th	104	104	105	107	108	109	110	65	66	66	67	68	68	69
	99th	111	111	113	114	115	116	117	73	73	74	74	75	76	76
4	50th	88	88	90	91	92	94	94	50	50	51	52	52	53	54
	90th	101	102	103	104	106	107	108	64	64	65	66	67	67	68
	95th	105	106	107	108	110	111	112	68	68	69	70	71	71	72
	99th	112	113	114	115	117	118	119	76	76	76	77	78	79	79
5	50th	89	90	91	93	94	95	96	52	53	53	54	55	55	56
	90th	103	103	105	106	107	109	109	66	67	67	68	69	69	70
	95th	107	107	108	110	111	112	113	70	71	71	72	73	73	74
	99th	114	114	116	117	118	120	120	78	78	79	79	80	81	81
6	50th	91	92	93	94	96	97	98	54	54	55	56	56	57	58
	90th	104	105	106	108	109	110	111	68	68	69	70	70	71	72
	95th	108	109	110	111	113	114	115	72	72	73	74	74	75	76
	99th	115	116	117	119	120	121	122	80	80	80	81	82	83	83
7	50th	93	93	95	96	97	99	99	55	56	56	57	58	58	59
	90th	106	107	108	109	111	112	113	69	70	70	71	72	72	73
	95th	110	111	112	113	115	116	116	73	74	74	75	76	76	77
	99th	117	118	119	120	122	123	124	81	81	82	82	83	84	84
8	50th	95	95	96	98	99	100	101	57	57	57	58	59	60	60
	90th	108	109	110	111	113	114	114	71	71	71	72	73	74	74
	95th	112	112	114	115	116	118	118	75	75	75	76	77	78	78
	99th	119	120	121	122	123	125	125	82	82	83	83	84	85	86
9	50th	96	97	98	100	101	102	103	58	58	58	59	60	61	61
	90th	110	110	112	113	114	116	116	72	72	72	73	74	75	75
	95th	114	114	115	117	118	119	120	76	76	76	77	78	79	79
	99th	121	121	123	124	125	127	127	83	83	84	84	85	86	87
10	50th	98	99	100	102	103	104	105	59	59	59	60	61	62	62
	90th	112	112	114	115	116	118	118	73	73	73	74	75	76	76
	95th	116	116	117	119	120	121	122	77	77	77	78	79	80	80
	99th	123	123	125	126	127	129	129	84	84	85	86	86	87	88

2. An 8 year old boy is referred to the Paediatric clinic by the General Practitioner (GP) with a 6 week history of cough.

The cough has been mostly dry but the mother has noticed moist cough at times. There is no specific time of the day where cough gets worse. However it comes in bouts and the child vomits occasionally. Mother has restricted many food items as she thinks it would exacerbate the cough. About two weeks before the onset of this illness, he has been treated for a febrile illness associated with cough and cold which subsided with medications. He also has had several respiratory illnesses over previous 6 months which required visits to the GP.

He was born at term with a birth weight of 3.2 kg and had an uncomplicated perinatal period. His immunization is up to date and he achieved milestones age appropriately.

Mother is healthy. Father died of an accident 2 years ago and he had cold and sneezing episodes as a child. According to mother he also had recurrent cough which she attributes to his smoking. They live in a two roomed house in a slum area. There are two pet dogs.

On examination, his height is on the 25th percentile and the weight is on the 10th percentile. He is active and afebrile. There are no chest deformities. The respiratory rate is 16 per minute. Air entry is equal with no added sounds. Cardiovascular examination is clinically normal. The liver is 3 cm palpable.

Investigations :

Chest x-ray

Hyperinflated lung fields

- 2.1. Give five (05) differential diagnoses in order of priority. (35 marks)
- 2.2. List the investigations you would do to arrive at a diagnosis. (35 marks)
- 2.3. What therapeutic interventions would you undertake? (30 marks)

Contd...../5

3. A 11 year old boy was referred to a paediatric clinic for evaluation of pain and weakness of his hands.

He had been a popular athlete in the school until he gave up sports three months ago as he developed neck and shoulder pain that prevented him pursuing in sports. Neck pain was attributed to a fall that he has sustained during the school inter-house high jump event. However, as the neck pain was persisting, his general practitioner (GP) did several blood investigations at that stage and they were normal. The GP has prescribed ibuprofen and recommended a period of rest and gradual introduction to sports after a course of physiotherapy.

Since then he focused on classroom studies and managed to play table tennis with his friends. However during last two weeks he found it difficult to hold the table tennis racket with his right hand and subsequently he found that his left hand also has become weak. He complained about pain and tingling sensation in both hands. But there was no joint swelling and no skin lesions were noted.

The blood tests were repeated at this stage and were normal except the blood picture, which has detected hypochromic microcytic anaemia.

The child became distressed and tearful during the consultation. It was noticed that he has soiled his clothes and mother took him to the washroom for cleaning. The mother was very emotional about the course of events that is happening and she was extremely worried about her child's future.

Examination revealed a child with appropriate intellectual capacity and asymmetrical weakness in both upper limbs with more distal wasting of muscles. The deep tendon reflexes of the upper limbs were absent. An ulcer was noticed on the dorsal aspect of his right middle finger.

He was admitted for further evaluation and following investigations were done.

Full Blood Count

Haemoglobin	9.5 g/dl	(12-15)
WBC	9.8 x 10 ⁹ /L	N - 55%, L- 40%, E - 5%
Platelet	305 x 10 ⁹ /L	
RBC	3.8 x 10 ¹² /L	(4.1 - 5.1 x 10 ¹²)
MCV	65 fl	(80 - 90)
MCH	20 pg	(27-30)
MCHC	30 g/dl	(32-35)
ESR	15 mm/hour	
C-Reactive protein	4 mg/dl	(< 6)
ANA	Negative	
Rheumatoid Factor	Negative	

- 3.1. What is the most likely diagnosis? (15 marks)
- 3.2. Mention two (02) other possible diagnoses. (20 marks)
- 3.3. List three (03) physical signs to support for localization of the lesion. (20 marks)
- 3.4. Give possible explanations for abnormal investigation results given above. (15 marks)
- 3.5. Suggest three (03) other useful investigations with expected abnormal findings in all 3 diagnoses you mentioned. (30 marks)

Contd...../7-

4. A 12 year old boy with beta thalassaemia major is transferred from a local hospital to a tertiary care hospital for further evaluation of progressive swelling of the body and shortness of breath of one month duration. He has complained of exercise intolerance over the past 3 months despite adequate blood transfusion.

A diagnosis of thalassaemia was made at the age of 18 months and he has been on regular transfusion since then. Iron chelation was started late due to the non-availability of a syringe pump. He underwent splenectomy at the age of 8 years.

On examination weight and height were below -2SD. He was not pale but mildly icteric. Bilateral ankle oedema with generalized abdominal swelling was noted. Liver was palpable 5 cm below the costal margin. He was dyspnoeic with cardiac apex felt at the left 6th inter-costal space in the anterior axillary line. The heart rate was 112 per minute, regular with moderate volume. Blood pressure was 90/60 mmHg. The heart sounds were soft and there were no murmurs. The respiratory rate was 30 per minute with sub-costal recessions and there were no added sounds.

Investigations:

Haemoglobin	9.5 g/dl
WBC/DC	8.9x 10 ⁹ /l N-48%, L-45%, M-2%, E-5%
CRP	<6 mg/dl

- 4.1. What is the most likely cause for the current presentation?(05 marks)
- 4.2. Write two (02) investigations to confirm the above. (10 marks)

He was managed based on the initial evaluation but showed no clinical improvement. During the hospital stay he became more oedematous with worsening of respiratory distress and was oxygen dependent. Abdomen was distended and there was evidence of free fluid. Further examination revealed reduced air entry bilaterally with dullness on percussion. He was apyrexial. As the respiratory distress was progressive he underwent pleural aspiration and the fluid was noted to be turbid. He also developed semi-formed loose stools without vomiting which did not respond to supportive therapy.

Contd..../8-

Investigations:

Stools full report	no pus cells or red cells.	
Urine full report		
pus cells	2-3/hpf	
proteins	nil	
Haemoglobin	10.3 g/dl	
WBC/DC	10.1x10 ⁹ /l	N-69%, L-19%, M-7%, E-5%
CRP	<6 mg/dl	
ALT	48iu/l	(20 – 40)
AST	54iu/l	(20 – 40)
Serum creatinine	44 µmol/l	(44 – 88)
Serum albumin	2.4 g/dl	(3.5 – 5.5)

4.3.

4.3.1. Write the complication which has subsequently developed.(10 marks)

4.3.2. Briefly describe the pathophysiology of the above clinical condition mentioned in 4.3.1. (20 marks)

4.4. Mention the investigations you will request to confirm the above clinical condition (mentioned in 4.3.1.) with the expected results. (15 marks)

4.5. Outline the management of the current clinical problem in this child. (40 marks)

5. An 8 year old boy was transferred to the casualty ward from a local hospital. He was accompanied by his grandmother. He has been unwell for past two days. There was a low grade fever and he experienced increased sweating. There was diffuse abdominal pain. He vomited 3-4 times and had one loose stool on the day of admission. There were no urinary symptoms. He had difficulty in walking and was brought to the ward in a wheel chair.

This child had been admitted to the paediatric ward, twice last year, had attended clinic and then had defaulted follow up. Grandmother was not aware of details of past illnesses. Past medical records are not available.

He is the second child of non-consanguineous parents. Father has left the family two years ago. Mother has gone for overseas employment 6 months back handing over the care of the child to the grandmother. His elder brother had died at the age of 10 years, after being treated in Pediatric Intensive Care Unit for about one week. Further details of brother's illness are not available. His 6 year old brother and 4 year old sister are healthy. He attends primary school in the village. His school attendance has been poor since mother left for employment. Grand mother is 60 years old, works as a tea plucker and earns about 10 thousand rupees per month.

On examination, he is ill looking, miserable and in pain. He is pale and febrile (38°C). There is deformity in the right knee. The joint is not inflamed, but he resists moving the leg.

Pulse rate is 120 per minute. The blood pressure is 90/50 mmHg. Capillary re-filling time is 2 seconds. There is no cardiomegaly. A soft ejection systolic murmur is heard in the pulmonary area.

There is right iliac fossa tenderness with guarding but there is no rebound tenderness or palpable masses in abdomen. Respiratory and central nervous systems are clinically normal.

His personal hygiene is poor and has several caried teeth and evidence of healed skin sepsis.

Contd.../10-

Following investigations are available from the local hospital.

Haemoglobin	8.0 g/dL	(11-16)
WBC/DC	10.5 x10 ⁹ /L N - 74%, L - 26%	
Platelet count	540 x 10 ⁹ /L	
CRP	10 mg/dl	(<6)
Urine full report	No abnormality	

Investigations done at emergency treatment unit (ETU) on admission

Haemoglobin	7.2 g/dl	(11-16)
WBC	11x 10 ⁹ /L N -78%, L - 22%	
Platelet count	520 x10 ⁹ /L	

- 5.1. Give the complete diagnosis. (25 marks)
- 5.2. Mention three (03) important investigations with their expected findings that will be useful to confirm the diagnosis. (15 marks)
- 5.3. Briefly describe the acute management. (30 marks)
- 5.4. Mention ten (10) other aspects in the management. (30 marks)