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# POSTGRADUATE INSTITUTE OF MEDICINE
# UNIVERSITY OF COLOMBO

## MD (PAEDIATRICS) EXAMINATION – JULY/AUGUST 2017

**Date:** 25th July 2017 **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 underweight, wasting and stunting based on anthropometric indices. (20 marks)

1.2 Briefly describe the pathophysiological changes in severe acute malnutrition. (20 marks)

1.3 Outline the management of severe acute malnutrition. (40 marks)

1.4 List the health and nutrition interventions you would promote to reduce severe acute malnutrition in Sri Lanka. (20 marks)

**Q.2.**

An eighteen month old, previously well child presented with hypoglycaemia (random blood sugar 20mg/dl) following an acute upper respiratory tract infection. He has been feeding poorly during the last 12 hours.

On examination he has no other physical signs.

2.1 Mention two (02) broad categories of conditions to account for this presentation. (20 marks)

2.2 What test will differentiate the two conditions mentioned in 2.1? (10 marks)

2.3 Describe briefly the mechanism of hypoglycaemia in both conditions mentioned in 2.1. (30 marks)

2.4 Discuss the investigations required if hypoglycaemia is recurrent in this child. (40 marks)

Contd...../2-

**Q.3.**

3.1 Outline the classification of hypothermia of newborn. (20 marks)

3.2 Describe the pathophysiological changes of hypothermia in new born. Indicate the relevant clinical features resulting from these changes. (60 marks)

3.3 List ten (10) steps you would take to prevent hypothermia in a newborn baby. (20 marks)

**Q.4.**

4.1 Outline clinical phases of a natural disaster. (15 marks)

4.2 Briefly outline specific categories of diseases and other associated problems in children following a natural disaster. (35 marks)

4.3 Name five (05) major risk factors for transmission of diseases in such a situation. (20 marks)

4.4 Mention preventive and control measures that has to be adopted by the local paediatrician following a natural disaster. (30 marks)

**Q.5.**

A five year old boy with relapsing nephrotic syndrome was brought to the emergency department in a state of shock.
The nephrotic syndrome was diagnosed at the age of two years and he is currently on prednisolone for the10$^{th}$ relapse. He has no proteinuria for the last four days.

On examination he was afebrile with feeble pulse and an unrecordable blood pressure. There was no oedema.

5.1 What is the most important information you would like to know in the history leading up to this presentation? (15 marks)

5.2 Mention the three (03) most likely differential diagnoses in order of priority for the above presentation. (35 marks)

5.3 List three (03) **specific therapeutic measures** in the immediate management of this patient. (15 marks)

5.4 List six (06) blood tests you would perform on this child immediately. (20 marks)

5.5 How would you confirm the most likely diagnosis in this child? (15 marks)

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**PAPER II – CASE HISTORIES**

Answer **all five (05)** questions.
Answer each question in a separate book.

1. Two week old Sithumi is admitted with a 2 day history of progressive vomiting, refusal of feeds and fever. There was no history of a cough and the urine output was adequate.

   The baby was born at term following an uncomplicated pregnancy with a birth weight of 3.2kg and was discharged the following day. This is the second born to consanguineous parents and they are very anxious as their first baby had died at 3 weeks of age following a 'similar illness'.

   On examination the baby is 2.46kg, ill and cold with some dehydration. The capillary refill time is 3 seconds, the peripheral pulses are felt with a heart rate of 150 beats per minute with a systolic blood pressure of 50 mmHg. The lung fields are clear and there is no significant organomegaly. Heart sounds and peripheral pulses are normal and there is no cardiomegaly. The capillary blood glucose is 50mg/100ml.

1.1. Give the principles of immediate management of this baby at this stage. (20 marks)

The maternal grandmother, herself being a mother of 6, had always been worried about 'the appearance' of this baby and had not agreed with the name given at the registration of birth.

Contd..../2-

The following results of investigations done on admission were available 4 hours later.

| | | | |
|---|---|---|---|
| Serum electrolytes | | | |
| $Na^+$ | 120 mmol/L | | (135-145) |
| $K^+$ | 7.0 mmol/L | | (3.5-5.3) |
| Blood sugar | 60mg/dl | | |
| Blood urea | 7.2 mmol/L | | (1.8-6.4) |
| Serum creatinine | 40 µmol/L | | (27-88) |
| Full blood count | $9.5 \times 10^9$/L | N- 60%, L-40% | |
| Platelet count | $300 \times 10^9$/L | | |
| Blood culture | pending | | |
| C-reactive protein | pending | | |

1.2. Give two (02) possible diagnoses. (10 marks)

1.3. Describe the features on examination to differentiate the conditions given in 1.2. (20 marks)

1.4. Give three (03) investigations to confirm the most likely diagnosis with the expected findings. (20 marks)

1.5. Describe the principles of long term management of the most likely diagnosis. (30 marks)

Contd...../3-

2. A five month old baby was transferred from a base hospital for respiratory distress. He has had mild fever and cough for three days and was admitted to the base hospital on the previous day. He was given oxygen and started on intravenous drugs. But the shortness of breath gradually became worse.

He was born at twenty eight weeks of gestation (28/52) with a birth weight of 1.05 kg. He was ventilated for seven days (Day1-7) and had needed incubator care for 4 weeks. There were no post-natal records with the mother and she did not know the details of the management at birth. Baby has had six weeks of hospital stay and had undergone an echocardiogram while in the SCBU and mother was told that there was no major structural abnormality.
He was discharged on vitamins and was followed up at the well-baby clinic. No subsequent investigations were done.

At the age of three months he was treated for a possible chest infection at the local hospital. He needed oxygen and intravenous medications and was discharged after eight days of hospital stay.

On examination his weight was 3.1 kg. He was alert, well hydrated and had central cyanosis. Respiratory rate was 62/minute with subcostal and intercostal recessions. Air entry was equal on both sides with bilateral coarse crepitations and scattered rhonchi.

His heart rate was 132/minute with good peripheral pulses. There were no significant murmurs, There was a 2 cm palpable liver. $SaO_2$ in room air was 84%.

2.1. Outline the immediate management of this baby. (20 marks)

On further questioning his mother said that the baby had rapid breathing and a dusky complexion since discharge from the SCBU.

Contd...../4-

Investigations revealed the following results:

| | | |
|---|---|---|
| WBC | 16.0 x$10^9$/L<br>N - 48 %, L - 48%, M - 4% | |
| Haemoglobin | 15.2 g/dl | |
| HCT | 50 % | |
| Platelet count | 343,000/µl | |
| CRP | 9 mg/L | (< 6) |

Arterial blood gas (while on 4 L of nasal prong $O_2$)

| | | |
|---|---|---|
| pH | 7.432 | (7.35 - 7.45) |
| $PCO_2$ | 51.9 mmHg | (35 - 45) |
| $PO_2$ | 34 mmHg | (80 - 100) |
| $HCO_3$ | 34.5 mmol/L | (20 – 24) |
| BE | 10.4 mmol/L | (-2 - +2) |

| | |
|---|---|
| Blood culture | Pending |
| CXR | Hyper inflated chest with peri-hilar inflammatory shadows |

2.2. Give the complete diagnosis. (20 marks)

2.3. List two (02) investigations you would perform to confirm the diagnosis given in 2.2. (15 marks)

2.4. Briefly outline the long term management of this child. (45 marks)

Contd...../5-

3. A 12 day old baby with lethargy was brought to the Emergency Department of the District General Hospital. He has had poor feeding which was attended to by a field midwife. In the preceding 12 hours he had become more lethargic and bluish discolouration of the feet were noted which had gradually increased.

   The baby was born at term by an elective LSCS to a 34 year old Rh negative mother with type 2 diabetes on metformin and nifedipine. His birth weight was 3.3 kg. No resuscitation was needed. Vitamin K 1mg was given. Neonatal examination was normal. Pulse oxymetry screening done prior to discharge was normal.

   On examination his weight was 2.4 kg. He was drowsy and floppy with a poor cry. His heart rate was 170/minute, with a respiratory rate of 52/minute with no cardiac murmurs. $SaO_2$ of both hands were 96% but unrecordable in both feet in room air. Both femoral pulses were weak. Bilateral dorsalis pedis and posterior tibial pulses were not palpable.

   His initial blood investigations were as follows

| | | |
|---|---|---|
| C-reactive protein | 5mg/dl | (<6) |
| Haemoglobin | 20g /dl | (17 – 22) |
| WBC | 19.9 x $10^9$/L | |
| | N - 48.5%, | L - 51.5% |
| Platelet count | 210 x $10^9$/L | |
| Blood Urea | 9 mmol/L | (4 - 6) |
| Serum Creatinine | 150 mmol/L | (60-115) |
| Serum Na | 185 mmol/L | (135-145) |
| Serum K | 5.2 mmol/L | (3.5 -5.5) |
| Blood culture | Pending | |

3.1. Give the complete diagnosis. (30 marks)

3.2. Mention the most relevant investigation you would perform at this stage. (20 marks)

3.3. Outline the management of this baby. (50 marks)

Contd...../6-

4. An 8-year-old previously healthy boy was brought to the paediatric casualty ward with a history of fever and slurring of speech. He has had an upper respiratory tract infection five days back. On examination, he had a GCS of 12/15.The muscle tone was normal in upper and lower limbs with brisk deep tendon reflexes and up going plantars. Cranial nerve examination was normal. There was no neck stiffness and fundoscopy was normal. Following admission to the ward he had two brief episodes of generalized tonic clonic seizures.

| | | |
|---|---|---|
| FBC | | |
| Haemoglobin | 11.8 g/dl | (11 – 15) |
| WBC | $15.2x10^9$/L | |
| Platelet count | $235x10^9$/L | |
| Blood urea | 5.2 mmol/L | (4-6) |
| Serum sodium | 138mmol/L | (135-145) |
| Serum potassium | 4 mmol/L | (3.5 -6.0) |
| ALT | 26 IU/L | |
| AST | 30 IU/L | |
| C-reactive protein | 7 mg/L | |
| Blood Culture | pending | |
| EEG | nonspecific generalized slow waves. | |
| Lumbar puncture (2 days after admission) | | |
| Protein | 32 mg/dl | |
| Glucose | 56 mg/dl (capillary blood glucose was 86 mg/dl) | |
| Polymorphs | 05 | |
| lymphocytes | 20 | |

4.1. Mention three (03) therapeutic interventions you would carry out at this point. (15 marks)

With the appropriate therapeutic interventions he gradually improved and was discharged in a stable condition after 14 days. A week later he developed slurring of speech and difficulty in walking and had two episodes of brief convulsions. On examination he was afebrile and confused. His muscle tone was increased in upper and lower limbs with brisk deep tendon reflexes. Plantars were up going and cranial nerve examination was normal. He had ataxia with no nystagmus. Fundoscopy was normal. Examination of the CVS, RS and abdomen revealed no abnormality.

Contd...../7-

Following investigations were performed.

| | | |
|---|---|---|
| FBC | | |
| Haemoglobin | 11 g/dL | (11 – 15) |
| WBC | 13.0 x$10^9$/L | N - 30%, L- 70% |
| Platelet count | 235x$10^9$/L | |
| Blood urea | 4.5 mmol/L | (4-6) |
| Serum sodium | 140 mmol/L | (135-145) |
| Serum potassium | 5 mmol/L | (3.5 -6.0) |
| ALT | 30 IU/L | (20-40) |
| AST | 20 IU/L | (20-40) |
| C-reactive protein | 7 mg/L | (<6) |
| EEG | generalized cerebral dysfunction with no definitive irritable foci. | |
| CT scan brain | Reported as "bilateral asymmetrical multifocal hypodense lesions in the cerebral white matter" | |

4.2. What is the most likely diagnosis? (15 marks)

4.3. List two (02) other possible diffrential diagnoses. (20 marks)

4.4. How would you confirm the diagnosis mentioned in 4.2? (10 marks)

4.5. Outline the management of this child. (30 marks)

4.6. Briefly discuss the outcome. (10 marks)

Contd...../8-

5. A 6 month old baby girl was brought to casualty with a history of recurrent fever, ear discharge and worsening cough and breathlessness of 3 months duration.

She is the first child of young non consanguineous parents and was born at term with a birth weight of 2.7kg. Mother had not gone for regular antenatal follow up as she had changed her residence. Father is a 30 year old driver and visits the family once in three months. Mother and the baby live with the grandparents and have good family support.

Baby was exclusively breast fed for 5 months but started on a formula milk by a General Practitioner as she was not gaining weight. She had two hospital admissions for lower respiratory tract infections and had been treated for recurrent infections at the Out Patients Department.

On admission her weight was 4kg with no dysmorphism. She was ill, febrile and pale with bilateral ear discharge. There was evidence of oral candidiasis and healed skin lesions. BCG scar was absent,

Her respiratory rate was 60/minute, with intercostal and sub costal recessions. On auscultation the air entry was equal on both sides with bilateral coarse crepitations. $SpO_2$ was 82% in air and increased to 89% with high flow $O_2$ by mask Heart sounds were normal. Both liver and spleen were just palpable.

| | | |
|---|---|---|
| Haemoglobin | 7.4g/dL | (11 – 15) |
| WBC | $4 \times 10^9$/L, N - 45%, | L - 45% |
| Platelet count | $200 \times 10^9$/L | |
| C-reactive protein | 12mg/dl | (< 6) |
| Blood culture | sent | |
| CXR | multiple opacities in both lung fields | |

5.1. Write three (03) possible aetiological agents to account for the respiratory illness. (15 marks)

5.2. Give the two (02) most likely underlying conditions. (10 marks)

5.3. List the investigations you would perform on this child with the expected findings-

5.3.1. To manage the acute condition (20 marks)

5.3.2. To identify the underlying condition. (15 marks)

5.4. Discuss the principles of management (excluding investigations) of this child. (40 marks)