



# THE COLLEGES OF MEDICINE OF SOUTH AFRICA

Incorporated Association not for gain  
Reg No 1955/000003/08

Examination for the Sub-specialty Certificate in Neonatology of the  
College of Paediatricians of South Africa

27 July 2017

Paper 1

(3 hours)

*All questions are to be answered. Each question to be answered in a separate book (or books if more than one is required for the one answer)*

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- 1 A 3.5kg neonate with a congenital diaphragmatic hernia (CDH) is referred to your institution for further management
- a) Discuss the respiratory management of this neonate, focusing on the mode of ventilation based on current best evidence. (5)
  - b) Describe the mechanisms of gaseous exchange in High Frequency Oscillatory Ventilation (HFOV). (5)
- A 1.5kg neonate develops a massive pulmonary haemorrhage
- c) Describe the pathophysiology of the pulmonary haemorrhage in this 1.5kg infant (5)
  - d) Discuss your management of pulmonary haemorrhage. (5)
- The blood pressure of a NICU patient decreases. You consider starting inotropes
- e) Discuss the use of Milrinone in the management of hypotension. (2)
  - f) Discuss the use of hydrocortisone in intractable hypotension (3)
- [25]
- 2 A 29-year-old woman with diabetes mellitus had a haemoglobin A<sub>1c</sub> (HbA<sub>1c</sub>) level of 10.1% early in the first trimester of her pregnancy. The HbA<sub>1c</sub> level had decreased to 8.2% by the third trimester. Her infant is delivered by elective caesarean section at 37 weeks gestational age
- a) Discuss the operational threshold for intervention in neonatal hypoglycaemia in an infant aged less than 48 hours, with specific reference to the case described. (7)
  - b) Write notes on an appropriate diagnostic workup in this infant of a diabetic mother. Motivate your answers. (18)
- [25]
- 3 You have been invited to the monthly mortality and morbidity meeting at one of the district hospitals in your drainage area. Discuss the following issues which come up for discussion in this meeting
- a) Define the following terms and explain how these indicators are used within the health system
    - i) Neonatal Mortality rate (NMR).
    - ii) Perinatal Mortality rate (PNMR).
    - iii) Perinatal Care index (PCI). (10)

- b) The majority of the babies who died in the last month in this District hospital had an abnormally low temperature on admission. Discuss the prevention and management of hypothermia in low resource settings. Advise the management of this hospital on the introduction of efficient but cost-effective strategies which can be implemented in this District hospital to deal with this problem. (15)

[25]

- 4 A female infant was born at 36 weeks gestation, weighing 3200g after an uneventful pregnancy. The Apgar scores were 8 at 1 minute and 9 at 5 minutes. The clinical examination post-delivery was normal. The infant was transferred to the postnatal ward with her mother and was discharged home, breastfeeding. At day 5 of life the infant was re-admitted because she was not feeding. For the preceding 24 hours she had been more sleepy than usual and had been passing less urine.

On examination she was awake but irritable. Her anterior fontanel was slightly depressed. She was clinically jaundiced. Temperature was 38.8°C, heart rate was 155/minute Weight 2800g. Clinical examination was otherwise unremarkable.

Results of investigations:	Haemoglobin	18.1g/dl
	Haematocrit	56%
	White cell count	19 x10 <sup>9</sup> /l
	Neutrophils	12 x 10 <sup>9</sup> /l
	Platelets	180 x 10 <sup>9</sup> /l
	Serum Sodium	175 mmol/l
	Serum Potassium	5.2 mmol/l
	Serum Chloride	103 mmol/l
	Serum Urea	10 mmol/l
	Serum Creatinine	59 µmol/l
	CFS	clear, colourless, no cells, no organisms
	CFS protein	0.6g/l
	CFS glucose	4.0 mmol/l
	CRP	<1

- a) What is the most likely diagnosis? (2)
- b) Explain the pathophysiology leading to this condition in the above mentioned baby. (5)
- c) Plan and motivate the treatment of the above mentioned baby. (3)
- d) Is acute kidney injury (AKI) present in this infant? (2)
- e) Motivate your answer by discussing an approach to the working definition of acute kidney injury (AKI) in neonates. (8)
- f) Identify the groups of patients at high risk of developing acute kidney injury (AKI) in the neonatal period. Motivate why these groups are at high risk. (5)

[25]



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### Examination for the Sub-specialty in Neonatology of the College of Paediatricians of South Africa

28 July 2017

Paper 2

(3 hours)

*All questions are to be answered. Each question to be answered in a separate book (or books if more than one is required for the one answer)*

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- 1 Write short notes on
- g) Levetiracetam. (5)
  - h) Intention to treat analysis. (5)
  - i) Erythropoietin as a neuro-protective agent. (5)
  - j) The use of NIRS (Near Infra Red Spectroscopy) in the NICU. (5)
  - k) Neonatal Purpura Fulminans. (5)
- [25]
- 2
- a) Write short notes on transient myeloproliferative disorder in neonates. (5)
  - b) A nulliparous pregnant woman is Rh negative and her husband is Rh positive (Rh gene complex: CDe/CDe)
    - i) What percentage of this couple's fetuses will be Rh positive? (1)
    - ii) How does ABO blood group compatibility influence the risk of having Rh incompatibility in this woman's first pregnancy? (1)
    - iii) Write notes on the non-invasive detection of **foetal** anaemia. (3)
  - c) Write short notes on the pathophysiology of pulmonary interstitial emphysema (PIE) and appropriate ventilation strategies. (10)
  - d) Write short notes on the concerns regarding phototherapy in extremely low birth weight neonates (weighing less than 1000 grams). (5)
- [25]
- 3
- a) Discuss the use of Palivizumab in the prevention of RSV related hospitalisation of premature babies in the South African context. Discuss the following aspects in your answer
    - i) The mode of transmission of the RSV virus.
    - ii) The population at high risk according to the South African guidelines.
    - iii) The timing and rationale for administration of Palivizumab. (10)
  - b) The control of Retinopathy of Prematurity is given high priority in the WHO's "Vision 2020 Programme". Discuss the use of Bevacizumab in the treatment of ROP under the following headings
    - i) The rationale for using Bevacizumab in ROP.
    - ii) Mode of action.
    - iii) Potential long term side effects. (10)

- c) Write short notes on the following (You may use Bevacizumab in the question above as an example)
- i) Off label drug.
  - ii) Unlicensed drug. (5)
- [25]
- 4 a) Discuss ethical issues in neonatal research involving human subjects under the following headings
- i) Justification.
  - ii) Research based on levels of risk. (5)
- b) Discuss the evidence-based research finding informing the recommendations regarding the feeding of very low birthweight infants. (5)
- c) Discuss the risk factors and pathogenesis of intracranial haemorrhage and periventricular leucomalacia (PVL) in very low birth infants. (15)
- [25]