



THE COLLEGES OF MEDICINE OF SOUTH AFRICA

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

Subspecialty Examination for the Certificate of Neonatology of the College of Paediatricians of South Africa

27 February 2020

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)

- 1 a) Write concise notes on the following underlying mechanisms of malformation in a foetus/neonate. Use examples to illustrate the differences
- i) Syndrome. (2)
 - ii) Sequence. (2)
 - iii) Association. (2)
- b) A neonate presents with cyanosis and poor peripheral perfusion shortly after birth. The cardiac ultrasound reveals a type B interrupted aortic arch. Dysmorphic features are present and the geneticist advises you to do special investigations to confirm the diagnosis of velo-cardio-facial syndrome. Answer the following questions with regard to the scenario above
- i) Give two other names that are commonly used for 'velo-cardio-facial syndrome'. (2)
 - ii) This baby presents with cardiovascular shock. Discuss the medical management of this baby with this specific congenital heart defect prior to surgical intervention. (6)
 - iii) The patient presents with seizures in the first week of life. Write short notes on the most likely cause of the seizures in this patient. (1)
 - iv) Outline the expected results of laboratory tests. (2)
 - v) Outline other clinical features, apart from convulsions, of this disorder. (2)
 - vi) You are counselling the parents regarding related co-morbidities. Name one long-term psychiatric disorder which is strongly associated with velo-cardio-facial syndrome. (1)
- c) A neonate is admitted for intensive care due to severe respiratory distress syndrome. An umbilical artery catheter (UAC) is inserted
- i) Draw a diagram to indicate the anatomical course of an UAC. (2)
 - ii) Indicate on the diagram the ideal placement(s) of an UAC. (2)
 - iii) The neonate presents with paraplegia as a complication related to the UAC. Explain the pathophysiology. (1)
- [25]
- 2 Discuss neonatal **hypocalcaemia** (low Ca) under the following headings
- a) Definition. (2)
 - b) Aetiology. (10)

- c) Presentation. (3)
 - d) Diagnosis. (5)
 - e) Management. (5)
- [25]
- 3
- a) You are called to evaluate an infant, Baby X who was noted to have a petechial rash soon after delivery. A complete blood count is obtained, which reveals a platelet count of $9 \times 10^9/L$. Discuss how the initial physical examination of the infant can guide your immediate approach to a differential etiological diagnosis and immediate management plan. (8)
 - b) Baby X above weighs 3450 g, and vaginal delivery was uncomplicated. She appears well except for scattered petechiae and bruising from heel-stick and venipuncture sites. The remaining results of the complete blood count are white blood cell count: 12,000/ μL with a normal differential; hemoglobin level: 18.3 g/dL
 - i) Discuss how can the morphology found on the blood smear of the baby help in the next step in the diagnostic workup in Baby X. (3)
 - c) Which two important questions regarding the specific medical history of the mother will assist in the diagnostic work-up of Baby X? (3)
 - d) Will a full blood count on the mother be helpful in the diagnostic work-up of baby X? Motivate what and how it will help in the diagnostic work-up. (5)
 - e) Write explanatory notes on the diagnosis and management of neonatal allo-immune thrombocytopenia (NAIT). (4)
 - f) The parents of Baby X are interested in having other children and are concerned about the risk of recurrence of allo-immune thrombocytopenia. What do you tell them? (2)
- [25]
- 4
- a) A newborn was delivered at 27 weeks with a birthweight of 820g. He was born to a 22-year-old P0G1 who went into preterm labor prior delivery. She received steroids before the birth of the baby. An ophthalmologist visits the NICU regular to examine the eyes of premature neonates. Discuss the following regarding Retinopathy of prematurity (ROP)
 - i) Definition.
 - ii) Risk factors.
 - iii) Pathophysiology. (10)
 - b) The above-mentioned neonate is diagnosed with ROP
 - i) Discuss management options for ROP and the long-term sequelae of the different treatment modalities. (15)
- [25]



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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)

- 1
 - a) Discuss commonly used techniques and novel approaches for administration of surfactant in a neonatal patient requiring non-invasive respiratory support. (10)
 - b) Define 'epigenetics' and use intra-uterine malnutrition to explain the concept. (3)
 - c) Write concise notes on the use of Doppler velocimetry in the assessment of fetal wellbeing. (3)
 - d) Discuss the pathogenesis of intra-uterine growth restriction in a fetus exposed to maternal smoking. (4)
 - e) Make use of a schematic diagram to explain the conjugation and excretion of bilirubin in neonatal jaundice. (5)
 - f) Write notes on the significance of the enterohepatic circulation of bilirubin in the neonatal period. (5)

[30]
- 2
 - a) Write short notes on the management of congenital syphilis. (10)
 - b) You are alerted by your hospital's Infection Prevention and Control (IPC) team that you have an outbreak of carbapenem resistant Enterobacteriaceae (CRE) in your unit. Discuss briefly the measures you can put into place in your unit to limit the spread of this outbreak. (10)
 - c) Write short notes on transient hypo-thyroxinaemia of prematurity. (10)

[30]
- 3
 - a) Describe current evidence-based therapies shown in randomized controlled trials to reduce bronchopulmonary dysplasia risk among very preterm infants. (10)
 - b) Write short notes on the neonatal indications, mechanism(s) of action and important adverse events for the following medications
 - i) Prostaglandin E₁ / Prostin. (10)
 - ii) Caffeine citrate. (10)
 - c) The NICU environment is a potential high-risk area for critical incidents and adverse events. Discuss how you as the neonatologist will ensure patient safety and best quality of care in the NICU environment. (10)

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- 4 a) Briefly discuss management strategies of mild to moderate painful procedures in neonates. (10)
- b) Discuss briefly the complications of gastroschisis, pre-; intra- and post-operative. (10)
- c) Discuss briefly the management of a baby with Neonatal abstinence syndrome. (10)
- [30]