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Neonatal clinician final examination for 2022

Part 1. Duration 2.5 hours. First morning

1a) A young mother has delivered a 36 week gestation baby, weighing 2.3kg. You would like this baby to be nursed skin to skin, but the mother is reluctant to do this.
How would you explain to this mother the benefits of skin to skin care for her baby?

1 Improved growth in weight and head circumference.

2 Reduction in hypothermia

3 Reduction in neonatal infection

4 reduced illness at 6 months and mortality

5 Closer monitoring of breathing and reduction in apnoea.

6 improved breast feeding, maternal satisfaction and bonding 30

1b) This mother eventually agrees to try skin to skin. Describe in the box below exactly how you would place her baby, and what advice you would give her.

Flexed limbs, head to side, 'sniffing' position, wrapper at level of ear, nappy and hat only. 20

Advise re sleeping, apnoea and breast and nasogastric tube feeding. 10

1c) Are there any clinical situations where skin-to-skin care is not appropriate

Jaundice requiring phototherapy, severe respiratory distress, repeated vomiting. 10
Unconscious so that cannot maintain airway

2) **Please write down an answer of True or False next to each of the following statements:**

2a) The correct dose of ampicillin for a 3-day old baby that you are treating for **meningitis** is 100mg/Kg given 12 hourly. T

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2b) Gentamicin should be given at a dose of 4mg/Kg every 36 hours in a baby of more than 32weeks gestation. F (5mg/kg)

2c) Gentamicin in high doses can be toxic to the ear and the kidney. T

2d) Procaine penicillin can be given intravenously. F

2e) Ceftriaxone has a narrow spectrum of antimicrobial activity, that is it only successful in treating a very small number of bacterial infections. F

6f) Meningitis when suspected should be treated with 7 days of antibiotics. F. 30

3a) Describe the physical differences between a low birth weight baby that is premature, and a low birthweight baby that is small for gestational age.

Posture	ability to suck	
Skin colour and texture	umbilical cord fleshy or thin.	20
Activity and cry		

3b) What particular problems might a small for gestational age baby have?

Hypothermia. Hypoglycaemia. Polycythaemia 15

3c). A baby of 36 weeks gestation is born weighing 1.9kg. Her mother calls you 2 hours after delivery and says that the baby is twitching and drowsy and will not suck. You check her blood sugar, it is 2.1mmol. Describe how you will manage this baby over the next 48 hours.

Check ABC

Check the baby's temperature and make sure the room is warm

Insert IV line and give 2ml/kg of 10% dextrose over 5 minutes

Note the baby's response and re check the sugar.

Start an IV infusion of 10% dextrose @ 80-90ml/kg/24 hours, and continue until feeding established. Then decrease gradually.

Monitor blood sugar and temperature

Start IV antibiotics, (with blood cultures first if possible). 25

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4) Please mark the following statements as True or False next to each

4a) A mask with a reservoir bag allows up to 100% oxygen to be delivered to a baby in respiratory failure. T

4b) Using a mask without a reservoir bag only allows about 40% oxygen delivery. T

4c) Oxygen saturation should be kept at 92-94% for a preterm baby < 32 weeks' gestation. T

4d) You must always use additional inspired oxygen for resuscitation of the newborn. F

4e) An oxygen concentrator can produce up to 95% oxygen. T

4f) Oxygen is a potentially dangerous inflammable gas. T

4g) According to WHO a Very Low Birth Weight (VLBW) infant weighs less than 1.5 Kg and more than 1.0Kg at birth. T

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5. Describe in the box below in detail how you would resuscitate the newborn infant described here.

A term baby boy has just been born vaginally following an antepartum haemorrhage. There was significant maternal blood loss. He is not breathing, is floppy, very pale and has a heart rate of 40 beats/minute. He is still attached to the mother by the umbilical cord. How would you start to resuscitate this baby?

Call for help.

Dry baby and keep warm with clean dry towel. Start clock. Assess tone colour, breathing heart rate
Cut the cord AFTER ONE MINUTE, LEAVING THE BABY BETWEEN THE MOTHER'S LEGS FOR THIS TIME, AND BEGINNING RESUSCITATION BY OPENING AIRWAY AND GIVING 5 INFLATION BREATHS. IF NECESSARY MOVE THE BABY TO THE RESUSCITATION TABLE AFTER ONE MINUTE, KEEPING THE BABY WARM.
(Open airway by head tilt and chin lift to place head in neutral position
Give immediately 5 inflation breaths using bag valve mask) 20

If the heart rate remains low, what must you check, and what should you do next?
Check CHEST IS RISING
Adjust airway : use 2 person, jaw thrust, or guedel airway, pad under shoulders Check airway not blocked by meconium or blood.
Heart rate is best sign of effective inflation breaths. 10

Re-examine and listen to heart rate again: If not yet breathing and if heart rate remains below 60 beats per minute, but the chest is rising, do 3 to 1 chest compressions and bag mask inflations.
Continue for 1 minute and reassess. 10

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If heart rate goes above 60 but THE BABY still not breathing what should you do? give bag valve mask ventilations 30/minute for a further 1 minute and reassess 10

If the baby starts breathing what should you do? consider giving to the mother in skin to skin contact and encourage breast feeding within one hour.
Return to check the baby after 30 mins. 10

Explain what you would do if after 20 to 30 minutes he doesn't breathe and doesn't have a heart beat despite all the actions you have undertaken.

The outlook is poor.
Consider giving adrenaline if it is available, although it is unlikely to affect the outcome. Also consider glucose.
Consider a fluid bolus because of the APH.
If any senior clinician is available consult with him/her.
Explain to the parents that their baby has died. 15
Document details of the resuscitation attempt.

6 You have successfully resuscitated the baby in question 5 above, although 15 minutes of bag and mask resuscitation were needed before he started to breathe. His weight is 3.8 kg. He has not wanted to breast feed. At 2 hours of age he starts to have generalised seizures/fits.

6a) What is the MOST LIKELY cause of the fits/ seizures/convulsions in this baby?

Hypoxic ischaemic encephalopathy 5

6b) Describe in the box below other causes of fits/ seizures/convulsions you should consider and what investigations you would perform on the baby described in 6a?

Other causes of fits/seizures/convulsions
Hypoglycaemia. Meningitis/sepsis
Intracranial haemorrhage 10
Less likely: metabolic or biochemical abnormality

Investigations you would undertake

Blood sugar. Oxygen saturations. Blood culture if available. Electrolytes if available. Haemoglobin or haematocrit

Lumbar puncture if meningitis suspected ONLY if the baby is stable 10

6c) Describe in sequence and in detail in the box below how you would manage this baby described in 6a above?

Assess ABC.
Check blood glucose and oxygen saturations. Give IV or oral glucose and oxygen if indicated.
Start antibiotics, ampicillin at high dose and gentamicin.
Start anticonvulsants, initially loading dose of phenobarbitone. Consider paraldehyde, phenytoin or diazepam if needed.
Monitor vital signs.
Monitor fluid balance and urine output.
Consider blood transfusion if the baby is shocked
Have bag and mask ready in case of apnoea
Keep parents informed 30

Part 2. Duration 2.5 hours. First day afternoon

7a) Why are newborn babies at risk of infection?

Why they are at risk: Immature immune systems, especially if premature 5

What maternal factors increase the risk of infection in a newborn baby?

Blood borne infection in mother, or from organisms in birth canal. PPROM.
Prolonged rupture of membranes especially if mother had signs of sepsis (fever, foul smelling liquor, septic shock) before birth.

What environmental factors after birth are important in transmitting infection?

poor hygiene, overcrowding. Nosocomial infection. 15

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7b) You are setting up a new neonatal unit in a hospital. What measures would you suggest to your staff to prevent infection in the nursery?

Clean equipment incubators etc.
Clean environment in delivery room and nursery
Hand washing staff and mothers
Keep baby with own mother only
Skin to skin care and breast feeding
Good cord care and eye care
Sterile precautions for procedures, IV lines etc 25

7c) A full-term baby boy aged 48 hours is admitted to the neonatal unit because of lethargy and reluctance to feed. His mother had been known to have a fever of 38.5 degrees C for the last 12 hours of her labour and her membranes had been ruptured for 36 hours before birth.

In the box below describe 1. what would you look for when you examine the baby? and 2 what bedside tests would you do?

1. Findings that might be present on examination (signs)

Abnormalities in: Colour, respiratory rate, work of breathing.
Pulse rate, capillary refill, heart sounds. 40
Abdomen look for distension and tenderness
Bulging fontanelle and decreased level of alertness

2. What bedside tests would you do?
Weight, head circumference, temperature, blood sugar, oxygen saturations. 25

7d) You find that the baby described in 7c) above is lethargic, and has a temperature of 38.0 degrees C, a pulse rate of 180/min and a respiratory rate of 70. He is refusing feeds and has lost more than 10% of his birth weight. His blood glucose is 2.5mmol/litre and his oxygen saturation is 94% in air.

In the box below describe what you think is wrong with the baby? Also describe in detail in the box his initial management including details of any drug treatment or fluid management you would undertake.

What is wrong? Early onset infection. Possible dehydration. 10

Management you would undertake:
Blood culture, IV amp and gent. IV 10% dextrose 60ml/kg.
Ask mother to express and try small NG feeds.
Monitor vital signs, temperature, blood sugar and oxygen saturations.

Also check hydration by monitoring urine output and daily weight. 25

8a) A baby of 32 weeks' gestation weighing 1.8 Kg is admitted to your unit. Describe in the box below the 5 most serious problems you think this baby might have as a result of his premature birth and low birth weight?

1 Hypothermia

2. hypoglycaemia
3. respiratory problems

4 feeding difficulties 25

5 jaundice

6 infection

8b) At the age of 4 hours, the baby in 8a above has a respiratory rate of 80/minute and oxygen saturations in air of 86%.
In the box below describe in sequence and in detail how you would manage this baby, including any equipment you would use, details of any drug treatment you would give, and any fluid management you would prescribe.

Monitor resp rate, temperature, saturations and blood sugar.

Oxygen (maintain sats 92 – 94%), CPAP

IV antibiotics (ampicillin and gentamicin) and IV 10%dextrose 60ml/kg

Small feeds of breast milk by orogastric tube as soon as stable. 30

8c) Describe in the box below how nasal CPAP works physiologically to help a baby with neonatal respiratory failure and what should be checked and monitored when nursing a baby on nasal CPAP.

How does it work
CPAP helps by providing PEEP to hold open the alveoli, which collapse due to surfactant deficiency.
Increases FRC. Improves gas exchange.
Reduces work of breathing
Stimulates surfactant deficiency 10

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What will you check on and monitor during treatment with nasal CPAP?
Check position and patency of nasal cannulae.
Check skin of nostrils for erosion.
Check gas flow rate is adequate with no leaks.
Monitor oxygen saturation.

20

9Please mark next to each the following statements as True or False.

9a) Body water content is high at birth in neonates. T

9b) In neonates urine output is low in the first few days. T

9c) Babies born at less than 29 weeks of gestation have high insensible water losses (that is water lost by evaporation from the skin and respiratory tract). T

9d) Small for gestation infants may need more than 60ml/kg of 10% dextrose on day 1 to supply adequate glucose. T

9e) Blood glucose levels are often low in term babies in the first few hours of life. T

9f) Very preterm infants will have less insensible water loss under a radiant heater than during skin to skin care. F

9g) Sodium supplements should be started after 48 hours of age in a baby on intravenous fluids and not yet breast feeding. T

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10a) In the box below describe what is meant by unconjugated hyper-bilirubinaemia and under what circumstances is it dangerous?

Bilirubin from breakdown of red blood cells (haemolysis), which has not been conjugated in the liver.
It is fat soluble and can get into brain

May cause kernicterus. 10

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10b) You are asked to see a term baby who is one day old. The midwife thinks he might be jaundiced. How would you assess the degree of jaundice in this baby?

Look at the baby in a good light.
Press skin to assess yellow colour.
How far down the body does the jaundice extend.
Look at palms and soles particularly. 10

10c) You agree that the baby is jaundiced. Describe in the box below the questions you would ask the mother and the midwife? Also describe how you would clinically assess the baby? What tests should you do?

Information requested
Is the baby well and feeding, are there any infection risks?
Can the midwife tell you the mother's blood group?
Is there any history of previous babies with jaundice or anaemia?
Has the baby passed meconium/changing stool/stool colour. 15

Clinical assessment of the baby
Assess degree of jaundice.
Check the weight and hydration.
Examine baby for danger signs, anaemia and enlarged liver and spleen. 20

Tests: If possible bilirubin level, if not clinical assessment of jaundice severity.
Check Hb and blood group and mother's blood group. If possible, look at a blood film.
Check stool colour 10

10c) Describe in the box below how you would manage the baby described in 10b above

The baby may need extra fluids.
Breast feeding should continue. 15
Give phototherapy.
Antibiotics if any suspicion of sepsis
Monitor bilirubin level if possible. If not monitor clinically, remembering more difficult after phototherapy

10d) Describe in the box below the important points you should ensure happen when nursing a baby under phototherapy.

Near to the light. All skin exposed. Turn baby every 2 hours.
Eyes covered.
Ensure hydration and temperature control.
Only take out of light for feeding.
Stop phototherapy when level low on chart, or clinically improved.
Watch for rebound after phototherapy stopped. 15

11) A 4kg baby has been delivered by ventouse extraction, following failed forceps delivery. There was a degree of shoulder dystocia and the second stage was prolonged and difficult.
You need to check this baby for possible birth trauma. What would you look for?

Cephalhaematoma. Sub aponeurotic haemorrhage
Facial nerve palsy. Brachial plexus palsy.
Fractured clavicle 15

Part 3. Duration 2.5 hours. Second day morning

12) Describe in the box below the important steps that you should take to ensure safety

a) when writing a prescription. b) when checking an intravenous drug that you are about to give

a) writing a prescription
Use block capitals
Use approved name of drug
Always write the word micrograms in full, so as not to confuse with milligrams
Try to avoid using decimal places
Use 24 hour clock for drug times 25
Sign for each drug individually.
Short course treatments should have stop date recorded when first prescribed.

b) checking an intravenous drug that you are about to give
Is it the right drug and right dilution?
Is the dose correct?
Have you checked the dose and prescription chart with someone else?

Have you checked the expiry date?
Is the IV site clear?
Does the drug need a flush (IV or NG), and if so, have you checked the flush?
Have you signed off the drug and disposed of sharps. 25

13a) A baby is seen on the post-natal ward on the second day of life. He is 3.5Kg. He is obviously centrally cyanosed and has a respiratory rate of 40/min.
In the box below describe at least 4 possible causes of central cyanosis?

cyanotic congenital heart disease.
Severe respiratory distress. 20
Upper airway obstruction
Persistent pulmonary hypertension
Convulsions
Septic shock ?

13b) When you examine this baby, describe in the box below what you would particularly look for?

Check airway

Signs of respiratory distress/work of breathing.
Colour
Peripheral pulses, heart sounds/murmur. 15

13c) In managing this baby describe in the box below any investigations that you could do to help you decide what the problem is?

Oxygen saturations
Hyperoxia test.
Blood pressure upper/lower limb
Chest xray if available 10

13d) In the box below describe how a baby with congenital heart disease might present in the first month of life?

Cyanosis,
circulatory collapse,
heart failure,
asymptomatic murmur. 20

14a) A 28 week gestation baby was successfully resuscitated at birth, and has been fed expressed breast milk by tube. On the 7th day of life he has an apnoeic attack, which responds to stimulation. When you examine him, you notice a distended abdomen..

In the box below describe what further information you need to know about the baby, and what features would you look for on examination?

Further information needed
Has the baby passed meconium? Is there blood in the stool? Is there any vomiting and if so is it bile stained?

Clinical findings on examination
Danger signs
Is he dehydrated?
Is the anus patent?
Is the baby in pain? Is there abdominal tenderness or mass? 20

14b) In the box below, and with respect to the baby above in 12a, state the most likely cause of the baby's problem and how would you try to confirm it?

What is the most likely cause of this baby's problem?
Necrotising enterocolitis

How would you try to confirm the diagnosis if the resources to do so were available?

Check stool for blood. Check Haemoglobin. 15
Abdo x-ray if possible.

14c) Describe in the box below in detail how you would manage the baby described in 14a) above.

Monitor vital signs
Nil by mouth and NG tube on free drainage. IV fluids.
Antibiotics: amp gent and metronidazole for at least 10 days.
Pain relief.
Watch for anaemia and transfuse if necessary.
Introduce small amounts of breast milk after 5 days if condition settling. 25

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15a. What is the difference between congenital and neonatal malaria?

Congenital malaria is parasitaemia in the first week of life, acquired from mother. 10
Neonatal malaria occurs after 8 days of age following mosquito bite.

15b) An HIV +ve mother presents with a high fever in labour and her blood is positive for malaria parasites soon after delivery. You are asked to see her baby at 48 hours, because he is not feeding and has fever and mild jaundice. What clinical signs would you look for when you examine this baby

Danger signs including lethargy, pallor, jaundice, hepatosplenomegaly, irritability. 15

15c). You think the baby might have malaria. What other diagnoses are possible? What tests should you do?

Early onset sepsis.
10
Other congenital infections.

Tests: Thick /thin blood film if available, or rapid test.
15
Blood sugar, Hb, blood cultures, bilirubin.

15d). Describe how you would manage this baby.

Check ABC
Intravenous artesunate : 3 doses IV in first 24 hours, then daily for 7 days, change to oral when tolerated,
Intravenous broad spectrum antibiotics.

Monitor temperature, blood sugar and jaundice level 20

Consider phototherapy

NG feeds if tolerated, may need IV fluids.

Advise parents on malaria prevention

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16a) A one-week old term baby was born at home in a remote district, and you do not have details of the delivery. The grandmother says that the baby was initially well but she is now arching her back and cannot feed. The umbilical stump is inflamed with some dark material adherent to it. Describe in the box below the clinical features in this baby that would make you suspect neonatal tetanus.

Previously well, but develops Irritability, difficulty feeding,

Clenched hands and jaw. Frequent muscle spasms.

Condition of umbilicus.
15

16b) Describe in the box below those treatments that can be used for managing a neonate with tetanus?

Intravenous high dose penicillin or metronidazole

IM tetanus immunoglobulin

Magnesium sulphate and IV or rectal diazepam for spasms.

Possible additional broad-spectrum antibiotics if evidence of omphalitis

Tetanus Immunisations for mother and baby (after recovery). 20

16c) Describe in the box below the important special points you should follow when nursing a baby with tetanus?

Careful attention to airway.

Bag and mask ready if using IV diazepam

Nurse in quiet dark environment.

Minimal handling

Small frequent NG feeds. 15

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16d) Describe in the box below the dangers of intravenous and rectal diazepam when used to help stop seizures in a neonate with tetanus and what vital signs you must measure and how frequently and what other precautions you must take when using this drug in this situation.

Possible dangers
Respiratory depression.
Apnoea 10

What vital signs would you measure?
Pulse rate 10
Respiratory rate
Oxygen saturation

What precautions will you take when using diazepam in a baby with tetanus
Ensure that diazepam is diluted if giving IV.
Ensure no extravasation.
Give the drug slowly over 15 minutes, and observe the baby carefully 10
Have a bag/mask beside the baby in case of resp depression

16e) What drug is preferable to diazepam in order to treat convulsions in a baby with tetanus?

Magnesium sulphate. Give a loading dose and then 4 hourly. 5
……

17) Please mark next to each the following statements as True or False.

a) Breast milk jaundice may last for as long as 12 weeks. T

b) Early onset sepsis in the newborn usually results from vertical transfer from the mother during pregnancy or labour. T

c) If meningitis is suspected a lumbar puncture must be done immediately even if the baby is unstable. F

d) Parenteral benzyl penicillin is the main treatment for syphilis in the newborn infant. T

e) A severe progressive purulent conjunctivitis occurring during the first days of life must be assumed to be due to gonococcus and treated immediately with an appropriate antibiotic after a sample of pus is taken and sent to the lab (if available) T

f) Skin redness plus oedema extending from the umbilicus is called omphalitis and needs anti-staphylococcal antibiotics. T

g) Varicella zoster in the mother and neonate is **not** a dangerous infection. F. 35

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