

Neonatal Intensive Care Unit Rotation Examination

This examination is part of a study to determine the utility of a residency oriented guidebook. We will be administering this test to you at the beginning and end of your NICU rotation to determine how much your medical knowledge and awareness of best patient care practices has improved over the rotation. The scores on this quiz will be deidentified and kept completely confidential. Please write a random number that you can remember (e.g. your ASCOM) on the top of the page. Thank you for taking the time to help improve our program.

1) You are admitting a 750-g female infant to the NICU for treatment of respiratory distress and presumed sepsis. The pregnancy was complicated by chorioamnionitis and preterm labor. The infant was intubated given surfactant, and both an umbilical venous catheter and umbilical arterial catheter were placed successfully in the delivery room. In the NICU, the infant is placed on a radiant warmer. The nurse caring for the infant asks if the infant will need to be transferred to an isolette incubator.

Of the following, the MOST likely reason for the infant to be relocated into an isolette incubator is:

- a) Avoidance of light damage to eyes
- b) Bronzing of the skin under the radiant warmer
- c) Inability to maintain core temperature on a radiant warmer
- d) Increased risk of infection under the radiant warmer
- e) Increased trancutaneous water loss under the radiant warmer

2) Danny is a 34 week preterm infant born early due to premature labor and a maternal UTI. His mother is 23 and has had IDDM for many years. Her diabetes reportedly was well managed during the pregnancy, and a recent hemoglobin A1c measurement was 7.0%. On physical examination, the infant is AGA, weighs 2 kg, and has a Ballard corresponding to 34 weeks. He requires supplemental oxygen with an FiO₂ of 0.40 administered by continuous nasal positive airway pressure.

Which of the following is the greatest concern for this infant related to his mother's diabetes?

- a) Hypoglycemia, Hypotension, Hypercalcemia
- b) Hypoglycemia, Bradycardia, Hypercalcemia
- c) Hyperglycemia, Hyperacusis, Aortic Stenosis
- d) Hyperglycemia, Hypocalcemia, Sepsis
- e) Hypoglycemia, Hypocalcemia, Polycythemia

3) Tommy is an otherwise healthy full term 2 day old newborn male with no ABO or Rh incompatibility. His bilirubin level rises to 9 mg/dL at 48 hours of life, which is within the low intermediate range for elevated bilirubin.

Which of the following mechanisms does NOT contribute to this rise in serum bilirubin?

- a) High circulating RBC mass and shortened RBC lifespan

- b) Decreased hepatic conjugation of bilirubin
- c) Inability to form photoisomers
- d) Increased enterohepatic circulation
- e) Presence of B-glucuronidase on the intestinal brush border

4) Adam is a two week old male infant born at 28 weeks gestation to a G1P1 mother. He has required parenteral nutrition since birth due to initial concerns for NEC.

Which of the following is Adam **NOT** at risk for developing, as a result of his prolonged TPN use?

- a) Direct Hyperbilirubinemia
- b) Candidiasis
- c) Osteopenia
- d) Vitamin D deficiency

5) You are called to the newborn nursery to evaluate a 2-hour old male who was born at term. The pregnancy was uncomplicated, but meconium staining was noted at delivery. The baby weighs 3.8 kg, is afebrile, and has a heart rate of 165 bpm with a respiratory rate of 70 bpm. You note tachypnea and hyperpnea with clear breath sounds, no murmurs, and strong distal pulses. His oxygen saturation on room air is 68%. You place a nonrebreather mask to deliver an FiO₂ of 1.0 but after 5 minutes the O₂ saturation is still only 72%

Which of the following is the best explanation of the patient's findings?

- a) Transposition of the Great Arteries
- b) Pneumonia
- c) Retained Fetal Lung Liquid Syndrome
- d) Persistent Pulmonary Hypertension of the Newborn
- e) Meconium Aspiration Syndrome

6) A two week old ex-25 week infant receiving TPN by central venous catheter with tip in the right atrium suddenly develops cardiorespiratory arrest and severe hypotension with a narrow pulse pressure.

What is the most likely etiology?

- a) Sepsis
- b) Pleural effusion
- c) Pericardial effusion
- d) Pneumothorax
- e) Pulmonary Hypertension

7) You are called to the delivery room for fetal decels and meconium stained amniotic fluid. The baby is delivered and noted to be covered in thick meconium, with no crying or respiratory effort. You intubate with a meconium aspirator and suction below the cords. The baby is placed on a mechanical ventilator

with the following settings: PIP 25, PEEP 5, IMV 45, inspiratory time 0.4, FiO₂ 1.0. You obtain the following blood gas: pH 7.22, pCO₂ 50, pO₂ 45, HCO₃ 21, base deficit -3.

What is the most likely etiology of this baby's hypoxemia?

- a) Respiratory Distress Syndrome
- b) Pneumothorax
- c) Persistent Pulmonary Hypertension of the Newborn
- d) Pneumonia

8) A 1000 gram 29-week infant is born by vaginal delivery and is placed on a ventilator and given surfactant. You are called with the following blood gas: pH 7.19, pCO₂ 65, PO₂ 80, HCO₃ 19, base deficit -6. Your current vent settings are PIP 16, PEEP 5, IMV 30, inspiratory time 0.4, FiO₂ 26%. How do you interpret this blood gas?

What settings can be changed on the vent in order to adjust your pCO₂ to a more appropriate level?

- a) Increase PEEP
- b) Increase PIP
- c) Decrease IMV
- d) Increase FiO₂
- e) Increase inspiratory time

9) A baby at 25 weeks gestation, now 24 hours old, is being treated with mechanical ventilation. He begins to have increasing oxygen requirement up to 85% FiO₂ and a blood gas shows PaCO₂ is rising.

What is the next best step in the management of the above patient?

- a) Disconnect from the vent and begin bag-mask ventilation while waiting for CXR
- b) Obtain blood cultures and begin empiric antibiotics
- c) Adjust your ventilator settings so that the patient blows off more CO₂
- d) Continue to monitor patient and evaluate with a repeat blood gas in one hour

10) A full term infant is born via spontaneous vaginal delivery to a mother whose prenatal labs are significant for positive Group B strep culture swab. All other labs are unremarkable. She received Ampicillin x 1 dose 2 hours prior to delivery and had ruptured membranes x 8 hours. Infant is well appearing and receives Apgars of 9 and 9 at 1 and 5 minutes. You are called to the well baby nursery because infant is now tachypneic with RR to the 80s and hypoxic with O₂ saturation of 85%. He improves after placement on nasal CPAP, PEEP 5, and FiO₂ 21%.

What is the next best step?

- a) CBC and blood cultures only
- b) CBC, blood culture, and antibiotics
- c) CBC, blood culture, and CXR
- d) CBC, blood culture, antibiotics, and CXR
- e) Observe the baby for improvement

11) You are called to the delivery room for a stat c-section due to cord prolapse and non-reassuring fetal heart rate. Upon delivery, the infant is cyanotic and floppy. You begin routine drying, stimulation and suctioning of the baby, and infant has minimal respiratory effort with a weak cry. You rapidly assess the heart rate, which is noted to be 80.

What is the next best step in management?

- a) Begin chest compressions
- b) Administer epinephrine
- c) Begin positive-pressure ventilation with bag-mask valve
- d) Administer 100% blow by oxygen
- e) Intubate the baby

12) A 2 kg, 34 week gestation infant is delivered to a mother who has chorioamnionitis and had a positive GBS UTI at 30 wks gestation. Four hours after birth, the infant requires admission to the NICU because of respiratory distress. Physical exam shows a temp of 36, HR of 160, RR of 80, BP of 60/30, MAP of 40, and Pulse ox of 82% on RA. The infant is poorly perfused with a cap refill of 4 seconds, and exhibits nasal flaring, intercostal, and subcostal retractions.

Which of the following are the most likely radiographic findings?

- a) Air bronchograms, diffusely hazy lung fields, and low lung volumes
- b) Cardiomegaly, hazy lung fields, and pulmonary vascular engorgement
- c) Fluid density in the horizontal fissure, hazy lung fields with central vascular prominence, and normal lung volumes
- d) Gas filled loops of bowel in the left hemithorax and opacification of the right lung field
- e) Patchy areas of diffuse atelectasis, focal areas of air-trapping, and increased lung volumes

13) You are treating a former extremely low gestational age newborn who was born at 26 weeks' gestation weighing 700 gm. She is now 4 weeks old. Her nurse asks when the eye examination for retinopathy of prematurity (ROP) will be performed.

When is the best time to obtain the first ROP screening eye exam?

- a) 4 weeks after discharge from the hospital
- b) 4 weeks after weaning from oxygen
- c) 5 weeks after birth
- d) 5 weeks after the expected due date
- e) 5 weeks after weaning from the ventilator

14) You are called to the newborn nursery to see a 2.1 kg term infant whose bedside glucose screening test is 30 mg/dL. The nurse describes the baby as generally lethargic, jittery with stimulation, and intolerant of oral feeding attempts at 4 hrs of age (poor suckling and emesis of small volumes of formula

taken). He was born at 41 weeks gestation to a mother who had poor weight gain, smoked cigarettes, and had hypertension. The APGAR scores following a vaginal delivery were 6 and 8 at 1 and 5 minutes, respectively. There is no history of maternal diabetes, illicit drug use, or intrapartum difficulties. On physical examination, the baby's vital signs are normal except for tachypnea (RR 80 bpm) with a pulse ox of 90% on RA. The infant has plethora, acrocyanosis, and generalized hypotonia. He exhibits rapid, shallow tachypnea, with clear lungs bilaterally on auscultation. There is a soft I/VI systolic murmur along the LLSB and no gallop. Upon stimulation, he has jittery hand movements. Lab findings include a serum glucose of 45, WBC count of 7 with a normal differential, Hct 70%, and Plt 150. The ABG reveals a pH 7.4, PaCO₂ 30, PaO₂ 75, and BE of -7.

What is the most appropriate treatment for this infant?

- a) Administration of Amphotericin B
- b) Double volume exchange transfusion
- c) Intubation and assisted ventilation
- d) Partial exchange transfusion
- e) Phototherapy

15) You have admitted a 750-g male infant to the NICU for treatment of RDS and presumed sepsis. The APGAR scores were 1, 5, and 7 at 1, 5, and 10 minutes respectively. The infant received one dose of exogenous surfactant in the delivery room. In the NICU, the infant is being care for on a radiant warmer. At 4 hours of life, physical examination reveals a temperature of 36.1 C, HR of 180 bpm, RR of 40 bpm (assisted breaths on the ventilator), BP Of 45/27, MAP of 30, and Pulse Ox of 92%. The infant is receiving SIMV with a PIP of 18, PEEP of 4, Rate of 40, and FiO₂ of 0.4. Umbilical catheters are in place in the umbilical artery and vein. On physical examination, you notice a soft, flat anterior fontanelle. You auscultate equal mechanical breath sounds over the chest and note minimal subcostal retractions, the skin is thin and somewhat moist, and many veins are visible through it. There is a small phallus and empty scrotum. The infant has diminished neuromuscular tone, is not active, but does respond to tactile stimulation.

What is the next most important step?

- a) Administer another dose of exogenous surfactant
- b) Consult the urologist for cryptorchidism
- c) Increase the inspired FiO₂ concentration
- d) Move the infant to an isolette incubator
- e) Obtain a head ultrasound to evaluate for any hemorrhage