

Latest Version: 6.0

Question: 1

An infant born at 37 weeks' gestation after a difficult delivery is recovering from perinatal asphyxia due to prolonged fetal decelerations. The infant was admitted to the NICU immediately after delivery due to poor Apgar scores, hypotension, poor circulation, and metabolic acidosis. To allow the bowel to recover from the ischemic insult, the infant should not receive enteral feedings for how long after birth?

- A. 8 to 12 hours
- B. 3 to 5 days
- C. 24 to 72 hours
- D. 5 to 7 days

Answer: C

Explanation:

Any infant who is recovering from asphyxia with significant evidence of shock should not receive enteral feedings for 24 to 72 hours to allow the bowel to recover from the ischemic injury. Infants with less severe forms of perinatal hypoxic-ischemic injury may be given minimal enteral feedings with mother's breastmilk as the benefit of the favorable microbiome in the milk could improve gut development.

Question: 2

Which of the following is the most critical component of creating an ethical environment in the NICU?

- A. Empathetic communication
- B. Allowing family to be involved in all aspects of infant care
- C. Providing palliative care when indicated
- D. Conscientious objection

Answer: A

Explanation:

Though all of the answer choices are important in creating an ethical environment in the NICU, empathetic communication is the most critical; clinicians should be compassionate not only in their listening but also in their communication to parents.

Question: 3

When considering weaning the infant from the ventilator, which of the following parameters reflect an improving infant, thus supporting ventilatory weaning and extubation?

- A. Peak inspiratory pressure of 18 to 22 cm H₂O
- B. Tidal volume values of less than 6 ml/kg
- C. Supplemental oxygen ranging between 21% and 30%
- D. Progressively increasing FiO₂ requirements

Answer: C

Explanation:

When ventilatory parameters are low, weaning the infant from the ventilator should be considered. Supplemental oxygen requirements ranging between 21% and 30% are indicative of an improving infant and weaning would be indicated.

Tidal volume values of greater (not less) than 6 ml/kg, increased activity and muscle tone in addition to progressively decreasing (not increasing) FiO₂ requirements, and peak inspiratory pressures of 16 to 18 cm H₂O all indicate an improving infant.

Question: 4

Which of the following types of heart murmurs is commonly heard in infants with truncus arteriosus?

- A. A diastolic murmur
- B. A holosystolic murmur
- C. A continuous murmur
- D. A pansystolic murmur

Answer: D

Explanation:

Truncus arteriosus is characterized by one great artery rising from the left and right ventricles, overriding a VSD. This single artery has one valve and gives rise to the coronary, pulmonary, and the brachiocephalic arteries. A second semilunar valve is absent. A coexisting VSD is present in more than 98% of cases. S₁ (the first heart sound) is normal, but S₂ is single and loud because of the single valve of the common trunk. A loud systolic ejection click is frequently heard, and a loud pansystolic murmur maximal at the LLSB (lower left sternal border) that radiates to the entire precordium is commonly heard. If the single truncal valve is insufficient, a blowing diastolic murmur may be heard. A wide pulse pressure is often present.

Question: 5

Delivery of continuous positive airway pressure (CPAP) by which of the following methods is the most common method used?

- A. Nasal pharyngeal tubes
- B. Nasal prongs
- C. Endotracheal (ET) tube
- D. Facemask

Answer: B

Explanation:

CPAP may be delivered by facemask, nasal pharyngeal tubes, nasal prongs, or ET tube; delivery of CPAP by nasal prongs is the most common method used. Use of short binasal prongs is the most effective. Choosing the correct size of nasal prongs is important to avoid movement and erosion of nasal tissue in the infant.

Question: 6

When an infant is receiving end-of-life care, all of the following interventions are discontinued except:

- A. Intravenous access
- B. Monitors and machines
- C. Measurement of vital signs
- D. Artificial feedings

Answer: A

Explanation:

When the decision is made to end or not begin aggressive medical intervention, the infant receives end-of-life care, which is also referred to as palliative or comfort care. During this time, all invasive procedures, including measurement of vital signs, monitors, machines, and artificial feeding, are discontinued. The infant, cleaned and wrapped in a warm blanket, is held by the family. Intravenous access may remain in place for the administration of pain medications or sedatives. Medications are given in doses sufficient to provide comfort, relieve pain, and ensure that the infant does not suffer at the end of his life.

Question: 7

The most common cyanotic congenital heart defect is:

- A. Atrioventricular septal defect
- B. Persistent pulmonary hypertension in the newborn (PPHN)
- C. Ebstein's anomaly
- D. Tetralogy of Fallot (TOF)

Answer: D

Explanation:

The four components of TOF are a VSD, an overriding of the ascending aorta, obstruction of the right ventricular outflow tract, and right ventricular hypertrophy. The predominant intracardiac shunt is usually right to left; therefore, most infants with TOF are cyanotic to varying degrees, depending on the amount of right-to-left intracardiac shunting and the amount of blood that enters the pulmonary circulation by the right ventricle.

PPHN is usually associated with severe antepartum or peripartum conditions that involve hypoxia reflected by low Apgar scores. These infants are generally term or late preterm and are symptomatic within the first few hours of life, with associated findings including polycythemia, hypoglycemia, and transient tachypnea and cyanosis associated with stress.

Ebstein's anomaly is an uncommon anatomic heart defect involving various degrees of cyanosis.

Atrioventricular septal defects occur when the endocardial cushions that form the central crux of the heart do not form normally; this can result in mild cyanosis, particularly in the immediate neonatal period.

Question: 8

Treatment of neonatal urinary tract infection (UTI) is indicated when:

- A. A complete blood count (CBC) reveals leukocytosis
- B. The infant is symptomatic
- C. Pyuria is present
- D. An organism is cultured from the urine

Answer: D

Explanation:

In a neonate with suspected UTI, treatment is indicated when an organism is cultured from the urine. The most advantageous method of obtaining urine for culture is suprapubic aspiration of the bladder or catheterization. Treatment involves antibiotic therapy for 10 to 14 days, with a follow-up urine culture three days after therapy is discontinued.

Pyuria, or white blood cells present in urine, can be observed in the neonate normally. Thus, this finding alone does not warrant treatment for UTI. If the infant is symptomatic, a urine sample, blood cultures, and a CBC should be performed and evaluated prior to initiation of treatment. A CBC that reveals leukocytosis (increased white blood cells) simply means the infant is likely fighting an infection, not necessarily a UTI, and warrants further testing.

Question: 9

Which of the following statements is true regarding pressure-support ventilation (PSV)?

- A. PSV complements the infant's respiratory effort by delivering a constant tidal volume with each breath

- B. PSV is to be used alone
- C. PSV is pressure-limited, constant flow, and time-cycled
- D. PSV decreases total minute ventilation

Answer: C

Explanation:

PSV complements the infant's respiratory effort by triggering a mechanical breath, preset to a specific pressure. PSV decreases the work of breathing created by airway resistance (i.e., narrowed diameter of neonatal ETT) and ventilator circuit resistance; pressure ventilators are pressure-limited, constant flow, and time-cycled; infants can only generate very small inspiratory efforts. PSV increases total minute ventilation, stabilizes breathing for preterm infants less than 32 weeks' gestation, and is used alone (if the infant has effective respiratory drive) or in conjunction with SIMV (synchronized intermittent mandatory ventilation).

Question: 10

In respiratory distress syndrome (RDS), grunting, nasal flaring, and chest retractions represent the infant's attempt to:

- A. Maintain a normal functional residual capacity (FRC)
- B. Decrease upper airway resistance
- C. Conserve energy
- D. Overcome airway obstruction

Answer: A

Explanation:

In RDS, the infant's immature lung anatomy and physiology cannot support oxygenation and ventilation, and functional residual capacity is reduced. The diaphragm contracts, creating an inspiratory pressure that moves less volume into the lungs than expected and simultaneously causes large sternal and intercostal retractions of the chest wall. In addition, infants with RDS are often tachypneic and demonstrate grunting; pallor or cyanosis may be present.

Energy conservation is important for the sick infant and is typically demonstrated by decreased tone and activity. Upper airway resistance is a function of nasal resistance and the cartilage supporting structures of the pharyngeal airway. Large airway obstruction is caused by mucus or congenital defects and is not relieved by grunting, flaring, or retracting.

Question: 11

The most effective strategy to prevent retinopathy of prematurity (ROP) is to:

- A. Implement oxygen targeting guidelines
- B. Monitor arterial blood gases

- C. Raise limits on oxygen saturation alarms
- D. Reduce the amount of ambient light to which the infant is exposed

Answer: A

Explanation:

Evidence-based research shows that implementing oxygen-targeting guidelines greatly reduces severe ROP; a systematic review and meta-analysis performed in 2011 found a 50% reduction in severe ROP when a lower rather than a higher oxygen saturation range was utilized.

There is no evidence that reducing ambient lighting decreases the incidence of ROP. Lowering, not raising, limits on oxygen saturation alarms has been shown to decrease the incidence of ROP. Monitoring arterial blood gases shows the oxygen level at just one point in time; therefore, continuous pulse oximetry is the preferred means to monitor oxygen levels.

Question: 12

The question of resuscitating a 25-week gestational infant against parental wishes is an example of:

- A. Palliative care
- B. An ethical dilemma
- C. Nonbeneficial treatment
- D. Best interest

Answer: B

Explanation:

A situation in which more than one possible course of action exists and differing values are held for each possible course of action by the parties involved constitutes an ethical dilemma. The question of resuscitating a 25-week gestational infant against parental wishes is a prime example of this. There is a 25% chance of survival without disability at 25 weeks' gestation. However, the infant will likely remain in the NICU for three to four months, with reduced maternal contact, painful procedures, and poor nutrition, as just a few complications that will arise. There are many factors to assess when making a decision such as this.

Best interest is a standard used to determine the validity of proxy consent in decision making. Nonbeneficial treatment is the notion that the efficacy of treatment is very low. Palliative care is an approach that improves the quality of life of patients and their families facing problems associated with life-threatening illness.

Question: 13

A male infant was born at 28-weeks' gestation via cesarean section. Immediately following delivery, the infant developed respiratory distress and required supplemental oxygen therapy and mechanical ventilation. His chest x-ray shows a reduction in lung volume and expansion and diffuse atelectasis.

The most likely cause of his respiratory distress is:

- A. Bronchopulmonary dysplasia
- B. Surfactant deficiency
- C. Pulmonary hypertension
- D. Transient tachypnea of the newborn (TTN)

Answer: B

Explanation:

Chest x-ray findings in the infant with surfactant deficient respiratory distress syndrome include diffuse atelectasis, a reduction in lung volume, and decreased lung expansion. Atelectasis increases lung density and results in visible outlines of air-filled bronchi against opaque lung tissue. Chest x-ray exam also reveals a ground-glass appearance that represents areas of atelectatic respiratory alveoli adjacent to expanded or hyperexpanded respiratory units.

Question: 14

To decrease the risk of contracting toxoplasmosis, the pregnant woman should avoid all of the following except:

- A. Eating fruits or vegetables not peeled or washed thoroughly
- B. Unnecessary exposure to raw meats
- C. Consuming pasteurized milk
- D. Cat feces

Answer: C

Explanation:

Toxoplasmosis is an infection caused by the parasite *Toxoplasma gondii* that is present in many warm-blooded animals, but has only been found to reproduce in the guts of cats. Therefore, women should avoid unnecessary exposure to cat feces. Using gloves and wearing a mask when emptying the litter box may provide protection to the pregnant woman if she must empty the litter box.

In addition, cooking meat thoroughly is vital; eating meat that is not fully cooked increases the risk of exposure, as raw meats such as pork, beef, and lamb are most likely to carry this parasite. Washing fruits and vegetables thoroughly before eating them decreases risk of infection. Even if peeling fruits or vegetables, they should still be rinsed. When a knife is used to cut into them, the parasite is simply pushed further into the fruit or vegetable. They should then be dried off with a paper towel or clean dish towel, as that can also remove some bacteria and parasites.

Finally, a pregnant woman (or woman attempting to become pregnant) should use hot, soapy water to wash her hands immediately after exposure to any infectious source, even after wearing gloves.

The pregnant woman should only consume pasteurized milk (and avoid raw milk) because it has been heated to kill off the parasite; raw milk can carry toxoplasmosis.

Question: 15

Most practitioners use a preterm infant's corrected age for degree of prematurity when monitoring development through:

- A. One year of age
- B. Two years of age
- C. 18 months of age
- D. Three years of age

Answer: B

Explanation:

The best evidence supports correcting for degree of prematurity, but whether it is best to correct through infancy is controversial, and there is no agreement as to when one should stop correcting for degree of prematurity. By convention, most practitioners correct through two years of age, though caution should be used when interpreting corrected age scores at 12 months or less for extremely low birth weight (ELBW) infants. Parental understanding may lead to an overly optimistic outlook that will not be supported by testing at a later date.