

Maternal-Fetal Medicine (MFM) Qualifying Practice Exam (Sample)

Study Guide



Everything you need from our exam experts!

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SAMPLE

Questions

- 1. Which of the following conditions is characterized by a beaded appearance of ribs?**
 - A. Thanatophoric Dysplasia**
 - B. Osteogenesis Imperfecta**
 - C. Hypophosphatasia**
 - D. Achondroplasia**
- 2. What type of pleural effusion is most commonly associated with lymphatic obstruction?**
 - A. Transudate**
 - B. Chylothorax**
 - C. Exudate**
 - D. Hemothorax**
- 3. What is a potential effect of multiple doses of steroids during pregnancy?**
 - A. Increased fetal head circumference**
 - B. Decreased fetal head circumference**
 - C. Improved fetal lung maturity**
 - D. Lower risk of gestational diabetes**
- 4. Which structure has the highest oxygen saturation in the fetus?**
 - A. Umbilical vein**
 - B. Deoxygenated IVC**
 - C. Left atrium**
 - D. Right atrium**
- 5. What is the most prevalent genetic disorder in Ashkenazi Jews?**
 - A. Tay-Sachs Disease**
 - B. Canavan Disease**
 - C. Gaucher Disease**
 - D. Fanconi anemia**

- 6. What is the first sign of local anesthetic toxicity?**
- A. Tinnitus**
 - B. Seizures**
 - C. Bradycardia**
 - D. Dizziness**
- 7. What is a common complication of Bronchopulmonary Sequestration (BPS)?**
- A. Right-sided heart failure**
 - B. Ipsilateral pleural effusion**
 - C. Systemic hypoxia**
 - D. Fetal growth restriction**
- 8. For which type of variables is the Chi-Square test best suited?**
- A. Continuous variables**
 - B. Categorical variables**
 - C. Discrete variables**
 - D. Ordinal variables**
- 9. What potential problems can aminoglycosides cause during pregnancy?**
- A. Cardiac malformations**
 - B. Hearing loss**
 - C. Possible renal problems**
 - D. Thyroid dysfunction**
- 10. What is the normal central venous pressure (CVP) range during pregnancy?**
- A. 2-6 mmHg**
 - B. 6-12 mmHg**
 - C. 8-12 mmHg**
 - D. 10-14 mmHg**

Answers

SAMPLE

1. B
2. B
3. B
4. A
5. C
6. A
7. B
8. B
9. C
10. C

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Explanations

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1. Which of the following conditions is characterized by a beaded appearance of ribs?

- A. Thanatophoric Dysplasia**
- B. Osteogenesis Imperfecta**
- C. Hypophosphatasia**
- D. Achondroplasia**

The condition characterized by a beaded appearance of the ribs is Osteogenesis Imperfecta. This disorder is a genetic condition that affects the production of collagen, a critical protein for bone strength and integrity. As a result, individuals with Osteogenesis Imperfecta often experience brittle bones that fracture easily. The beaded appearance of ribs in this condition arises due to the irregularities in bone mineralization and structure. The ribs may show abnormal shapes and sizes, leading to this distinctive appearance, which can be seen on imaging studies like X-rays. Additionally, in Osteogenesis Imperfecta, patients may also present with other skeletal deformities, blue sclera, dental issues, and hearing loss, further showcasing the systemic implications of the underlying collagen deficiency. This unique association with rib appearance helps in the clinical diagnosis of the condition among the options provided.

2. What type of pleural effusion is most commonly associated with lymphatic obstruction?

- A. Transudate**
- B. Chylothorax**
- C. Exudate**
- D. Hemothorax**

Chylothorax is the type of pleural effusion that is most commonly associated with lymphatic obstruction. This condition occurs when there is an accumulation of lymphatic fluid in the pleural space, typically due to disruption or obstruction of the thoracic duct. Conditions that can cause lymphatic obstruction include trauma, malignancies, and infections. The lymphatic fluid that pools in the pleural cavity is rich in triglycerides, which distinguishes chylothorax from other types of effusions. In contrast, transudative effusions are usually due to systemic factors that alter the balance of hydrostatic and oncotic pressures, such as heart failure or cirrhosis, rather than lymphatic obstruction. Exudative effusions result from local factors like infection or inflammation, leading to increased permeability of pleural membranes. Hemothorax involves the accumulation of blood in the pleural cavity, typically following trauma or vascular injury, rather than lymphatic fluid.

3. What is a potential effect of multiple doses of steroids during pregnancy?

- A. Increased fetal head circumference
- B. Decreased fetal head circumference**
- C. Improved fetal lung maturity
- D. Lower risk of gestational diabetes

Multiple doses of steroids during pregnancy can lead to decreased fetal head circumference. Corticosteroids are often administered to pregnant women preterm, particularly when there is a risk of preterm birth, to enhance fetal lung maturity and prevent neonatal complications. However, the administration of steroids has been associated with effects on fetal growth, particularly influencing the rate of growth of various fetal structures, including head circumference. While corticosteroids can significantly improve outcomes for preterm infants by promoting lung maturity, the glucocorticoid effects can potentially restrict fetal growth, leading to a reduction in head size when administered in higher doses or over a prolonged period. This phenomenon is reflective of the intricate balance between administering medications to optimize fetal health outcomes and the potential for unintended effects on fetal growth parameters. In contrast, the other options relate to positive outcomes of steroid use: increased fetal head circumference is generally not a noted effect; improved fetal lung maturity is indeed a positive outcome of steroid administration; and a lower risk of gestational diabetes is not associated with steroid therapy—it may actually increase such risks.

4. Which structure has the highest oxygen saturation in the fetus?

- A. Umbilical vein**
- B. Deoxygenated IVC
- C. Left atrium
- D. Right atrium

The umbilical vein is the structure with the highest oxygen saturation in the fetus. This is primarily because the umbilical vein carries oxygen-rich blood that is delivered from the placenta, where maternal blood undergoes gas exchange, to the fetus. This oxygen-rich blood is essential for fetal development and is crucial for meeting the metabolic demands of the growing fetus. When blood flows from the placenta into the umbilical vein, it is typically around 80% saturated with oxygen, which is relatively high compared to other structures in fetal circulation. As the blood progresses through the fetal circulation, it becomes mixed with deoxygenated blood, particularly in areas like the right atrium and the left atrium, where the oxygen saturation is lower due to mixing with blood returning from the fetus's body. The deoxygenated inferior vena cava (IVC) transports blood low in oxygen from the lower part of the body back to the heart, while both the left and right atria receive blood that is also mixed, leading to lower oxygen saturation levels than found in the umbilical vein. The left atrium, which receives oxygen-rich blood from the lungs after birth, is not relevant in fetal circulation, as the lungs are not yet functional for gas exchange. Ultimately

5. What is the most prevalent genetic disorder in Ashkenazi Jews?

- A. Tay-Sachs Disease**
- B. Canavan Disease**
- C. Gaucher Disease**
- D. Fanconi anemia**

The most prevalent genetic disorder in Ashkenazi Jews is Tay-Sachs disease. This condition is caused by a deficiency of the enzyme hexosaminidase A, leading to the accumulation of GM2 gangliosides in the brain, which results in progressive neurological decline. The carrier frequency for Tay-Sachs among Ashkenazi Jews is approximately 1 in 27, which is significantly higher than in the general population. In contrast, while Gaucher disease is indeed more common among Ashkenazi Jews and involves a deficiency in the enzyme glucocerebrosidase, Tay-Sachs disease is more widely recognized as the predominant genetic disorder of this group due to its higher prevalence and the severe implications of the condition, particularly in terms of early death in affected children. Canavan disease and Fanconi anemia, while present in this population, do not reach the same level of frequency as Tay-Sachs.

6. What is the first sign of local anesthetic toxicity?

- A. Tinnitus**
- B. Seizures**
- C. Bradycardia**
- D. Dizziness**

The phenomenon of local anesthetic toxicity typically progresses through a predictable spectrum of symptoms, and the initial signs can be quite subtle. Tinnitus, or ringing in the ears, is often one of the earliest indications of systemic toxicity from local anesthetics. This symptom arises due to the effect of the anesthetic on the central nervous system, specifically affecting auditory pathways and leading to alterations in perception. In this context, recognizing tinnitus as the first sign is crucial, as it may manifest before more severe symptoms such as seizures, bradycardia, or dizziness occur. The progression may be observed starting from mild central nervous system excitatory symptoms, leading to tonic-clonic seizures in more severe cases. It is essential for healthcare providers to monitor for these early signs of toxicity to intervene appropriately before the situation escalates.

7. What is a common complication of Bronchopulmonary Sequestration (BPS)?

- A. Right-sided heart failure**
- B. Ipsilateral pleural effusion**
- C. Systemic hypoxia**
- D. Fetal growth restriction**

Bronchopulmonary Sequestration (BPS) is a congenital lung anomaly where a portion of lung tissue lacks normal connection to the airway and can have its own blood supply. One common complication associated with BPS is ipsilateral pleural effusion, which is fluid accumulation in the pleural space on the same side as the affected lung tissue. This occurrence is thought to be related to inflammation and irritation caused by the abnormal lung tissue, leading to increased pleural fluid production. The presence of ipsilateral pleural effusion can complicate the clinical management of BPS and may affect respiratory function, as well as contribute to other difficulties in the fetal or neonatal period. It is clinically significant because it can mask or mimic other pathologies, potentially leading to misinterpretation of imaging studies or delays in proper management. Other potential complications such as right-sided heart failure, systemic hypoxia, and fetal growth restriction are less directly associated with BPS itself. While these conditions may arise as secondary issues if the entity leads to significant respiratory compromise or cardiovascular strain, the direct link and recognition of ipsilateral pleural effusion makes it a more common complication within the context of BPS.

8. For which type of variables is the Chi-Square test best suited?

- A. Continuous variables**
- B. Categorical variables**
- C. Discrete variables**
- D. Ordinal variables**

The Chi-Square test is most appropriately applied to categorical variables. This statistical test is designed to assess whether there is a significant association between two categorical variables, or to compare observed frequencies in various categories with expected frequencies. Categorical variables represent distinct groups or categories without any inherent numerical value or order, such as gender, race, or the presence/absence of a condition. The Chi-Square test evaluates how the distribution of sample categorical data compares to an expected distribution. While other types of variables may have their own statistical tests (such as t-tests for continuous variables), the Chi-Square test specifically leverages the categorical nature of its data to draw meaningful conclusions about relationships and associations between different groups.

9. What potential problems can aminoglycosides cause during pregnancy?

- A. Cardiac malformations**
- B. Hearing loss**
- C. Possible renal problems**
- D. Thyroid dysfunction**

Aminoglycosides, which are a class of antibiotics, are known to be ototoxic, meaning they can cause hearing loss. In the context of pregnancy, one of the prevailing concerns associated with aminoglycosides is their potential impact on the developing fetus. Aminoglycosides can cross the placenta, and their use during pregnancy is particularly scrutinized due to the risks of adverse effects on the fetus. Hearing loss is a recognized risk due to the potential for ototoxicity, which can occur in utero if the medication is administered during critical periods of auditory development. It is especially relevant in cases where the mother requires prolonged treatment with these antibiotics or if higher doses are given. The potential for renal problems is another concern, as aminoglycosides can cause nephrotoxicity, particularly in adults and potentially in fetuses due to the immature renal function in newborns. This could lead to complications such as altered fluid and electrolyte balance and, in severe cases, may necessitate further medical intervention postpartum. While cardiac malformations and thyroid dysfunction have associated risks with certain medications, they are not typically linked to aminoglycosides, thus making renal complications and hearing loss the primary areas of concern regarding the use of this class of antibiotics.

10. What is the normal central venous pressure (CVP) range during pregnancy?

- A. 2-6 mmHg**
- B. 6-12 mmHg**
- C. 8-12 mmHg**
- D. 10-14 mmHg**

The normal central venous pressure (CVP) range during pregnancy generally increases due to several physiological changes, including increased blood volume and altered hemodynamics. The typical range is around 8-12 mmHg, which reflects the body's adaptation to support the growing fetus and manage the increased blood flow required during pregnancy. This value is higher than the normal CVP found in non-pregnant individuals, which is usually around 2-6 mmHg. The elevated CVP during pregnancy also indicates effective venous return to the heart and can be influenced by the position of the mother, uterine pressure, and fluid status. Maintaining this range is essential for proper placental perfusion and overall maternal health.