# Air Methods Critical Care Practice Exam (Sample)

## Study Guide


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# Questions

**1. What assessment should be made for a patient with suspected traumatic coagulopathy?**

**A. Clotting factor levels only**

**B. Platelet count and D-Dimer levels**

**C. Fibrinogen and INR only**

**D. Complete blood count only**

**2. What indication suggests the need for platelets in a medical setting?**

**A. Increased hemoglobin levels**

**B. Bleeding and thrombocytopenia**

**C. Decreased coagulation factors**

**D. Stable blood pressure**

**3. What is the normal QRS duration in seconds?**

**A. 0.02-0.06 seconds**

**B. 0.04-0.12 seconds**

**C. 0.12-0.20 seconds**

**D. 0.20-0.25 seconds**

**4. An S4 heart sound indicates what physiological event?**

**A. Atrial contraction into a compliant ventricle**

**B. Rapid ventricular filling into a compliant ventricle**

**C. Atrial contraction into a noncompliant ventricle**

**D. Opening of a defective atrioventricular valve**

**5. What is the universal recipient blood type?**

**A. O positive**

**B. A negative**

**C. AB positive**

**D. B positive**

**6. Which coronary artery blockage is related to low lateral wall ischemia?**

- **A. Right coronary artery**
- **B. Anterior descending artery**
- **C. Circumflex artery**
- **D. Left main artery**

**7. What is the significance of recombinant DNA technology in the production of Cryoprecipitate?**

- **A. It improves the safety of transfusion practices**
- **B. It increases the volume of product available**
- **C. It enhances the flavor of the infusion**
- **D. It reduces the cost of production**

**8. Which rhythms are considered shockable during ACLS?**

- **A. Atrial fibrillation and junctional rhythm**
- **B. Ventricular fibrillation and V tach (pulseless)**
- **C. Asystole and PEA**
- **D. Ventricular dysrhythmia and sinus tachycardia**

**9. Which RSI drug is known for having a bronchodilator effect?**

- **A. Etomidate**
- **B. Rocuronium**
- **C. Succinylcholine**
- **D. Ketamine**

**10. What is the recommended defibrillation dose for pediatric patients in PALS?**

- **A. 1 J/kg**
- **B. 2 J/kg**
- **C. 3 J/kg**
- **D. 4 J/kg**

# Answers

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

# Explanations

## 1. What assessment should be made for a patient with suspected traumatic coagulopathy?

**A. Clotting factor levels only**

**B. Platelet count and D-Dimer levels**

**C. Fibrinogen and INR only**

**D. Complete blood count only**

**For a patient with suspected traumatic coagulopathy, it is important to assess multiple components of the hemostatic system. Monitoring platelet count and D-Dimer levels provides critical information regarding the patient's clotting status. Platelet count is essential because thrombocytopenia, or a low platelet count, can contribute to coagulopathy as platelets play a crucial role in the clotting process. A decrease in platelet count indicates an increased risk of bleeding and difficulty in forming stable clots.**
**D-Dimer levels are also significant in the assessment of coagulopathy. Elevated D-Dimer levels suggest the presence of fibrin degradation products, which can occur in cases of disseminated intravascular coagulation (DIC) or significant thromboembolic events. This test helps to evaluate the ongoing breakdown of clots and indicates an activation of the coagulation cascade, which is particularly relevant in a trauma setting. In combination, analyzing platelet counts and D-Dimer levels aids in identifying the underlying issues with the patient's coagulation status, guiding the management of traumatic coagulopathy effectively. Overall, this thorough assessment is integral to developing a treatment strategy for the affected patient to minimize bleeding complications and ensure appropriate interventions.**

## 2. What indication suggests the need for platelets in a medical setting?

**A. Increased hemoglobin levels**

**B. Bleeding and thrombocytopenia**

**C. Decreased coagulation factors**

**D. Stable blood pressure**

**The need for platelet transfusion is primarily indicated by the presence of bleeding accompanied by thrombocytopenia, which is a condition characterized by a low platelet count. Platelets are essential components of blood that play a crucial role in the clotting process. When thrombocytopenia occurs, the risk of bleeding increases significantly, and patients may experience spontaneous bleeding or have difficulty managing bleeding from minor injuries. In situations where a patient presents with both symptoms of bleeding and a recognized deficiency in platelet levels, the administration of platelets can help restore the patient's ability to form clots, effectively reducing the risk of severe hemorrhage. This makes the combination of bleeding and low platelets a clear and critical indicator for the administration of platelets in a medical setting. Other factors mentioned, such as increased hemoglobin levels or decreased coagulation factors, do not directly indicate a need for platelets. Stable blood pressure indicates hemodynamic stability and does not provide information regarding bleeding or platelet counts, thus excluding it from consideration as an indication for platelet transfusion.**

## 3. What is the normal QRS duration in seconds?

**A. 0.02-0.06 seconds**

**B. 0.04-0.12 seconds**

**C. 0.12-0.20 seconds**

**D. 0.20-0.25 seconds**

**The normal QRS duration, which reflects the time taken for ventricular depolarization, typically ranges from 0.04 to 0.12 seconds. This duration indicates the efficiency and speed with which electrical impulses travel through the ventricles. A QRS interval within this range suggests that the conduction system is functioning properly without any significant delays, such as those seen in conditions like bundle branch blocks or other intraventricular conduction delays. A duration shorter than 0.04 seconds is generally considered abnormal, indicating possible conduction abnormalities, while a duration longer than 0.12 seconds can signify a delay in electrical conduction through the ventricles. Thus, recognizing the normal QRS duration is essential for interpreting electrocardiograms and for diagnosing cardiac conditions effectively.**

## 4. An S4 heart sound indicates what physiological event?

**A. Atrial contraction into a compliant ventricle**

**B. Rapid ventricular filling into a compliant ventricle**

**C. Atrial contraction into a noncompliant ventricle**

**D. Opening of a defective atrioventricular valve**

**An S4 heart sound, often referred to as an "atrial gallop," occurs just before the S1 sound in the cardiac cycle. It is specifically associated with the atrial contraction phase, where the atria contract to push blood into the ventricles. This sound typically arises in the context of a noncompliant ventricle, meaning that the ventricle is stiff or has reduced compliance, which can occur in conditions such as left ventricular hypertrophy or heart failure. When the atria contract into a noncompliant ventricle, the influx of blood creates turbulence, generating the S4 sound. The presence of an S4 is often indicative of underlying cardiac dysfunction or pathology, highlighting the importance of the relationship between atrial activity and ventricular compliance. Thus, identifying an S4 heart sound can be a critical diagnostic clue in assessing cardiac function. The other choices reflect different cardiac events that do not accurately describe the situation that produces an S4 sound, particularly the compliance state of the ventricle in relation to blood flow and atrial contraction. This differentiates the S4 sound from other sounds related to different cardiac dynamics.**

## 5. What is the universal recipient blood type?

**A. O positive**

**B. A negative**

**C. AB positive**

**D. B positive**

**The universal recipient blood type is AB positive because individuals with this blood type can receive blood from all other blood groups without experiencing an adverse reaction. This is due to the presence of both A and B antigens on their red blood cells and no anti-A or anti-B antibodies in their plasma, allowing them to accept any type of blood (A, B, AB, or O) without triggering an immune response. This characteristic is particularly important in transfusion situations, as it provides flexibility in matching blood types during emergencies or when blood supply is limited. As a result, people with AB positive blood type are often considered ideal candidates for receiving blood donations from different blood types and can safely receive transfusions across the ABO and Rh blood group systems.**

## 6. Which coronary artery blockage is related to low lateral wall ischemia?

**A. Right coronary artery**

**B. Anterior descending artery**

**C. Circumflex artery**

**D. Left main artery**

**Low lateral wall ischemia is primarily associated with the circumflex artery. The circumflex artery supplies blood to the lateral portions of the left ventricle, which is essential for maintaining adequate oxygen delivery to the myocardium in that region. When there is a blockage in the circumflex artery, the blood flow to the lateral wall is compromised, leading to ischemia and potential injury to that area of the heart muscle. The circumflex artery is important in providing oxygenated blood to the lateral wall of the left ventricle. Therefore, ischemia in this area would logically be linked to occlusion of this specific artery. Understanding the anatomy and blood supply of the coronary arteries is crucial for diagnosing and treating ischemic conditions effectively.**

## 7. What is the significance of recombinant DNA technology in the production of Cryoprecipitate?

**A. It improves the safety of transfusion practices**

**B. It increases the volume of product available**

**C. It enhances the flavor of the infusion**

**D. It reduces the cost of production**

**Recombinant DNA technology plays a crucial role in improving the safety of transfusion practices. By utilizing this technology, clotting factors, such as those found in Cryoprecipitate, can be produced in a controlled laboratory environment, minimizing the risk of contamination from bloodborne pathogens. This advancement is particularly significant for patients requiring transfusions, as it reduces the potential exposure to infectious agents that could be present in traditional blood product preparations derived directly from human donors. Additionally, the ability to produce these components through recombinant means ensures higher purity and consistency, which is vital for patient safety. This focus on creating safer blood products aligns with the evolving standards in transfusion medicine to prioritize the well-being of patients receiving these critical treatments.**

## 8. Which rhythms are considered shockable during ACLS?

**A. Atrial fibrillation and junctional rhythm**

**B. Ventricular fibrillation and V tach (pulseless)**

**C. Asystole and PEA**

**D. Ventricular dysrhythmia and sinus tachycardia**

**During Advanced Cardiovascular Life Support (ACLS), it is crucial to recognize which cardiac rhythms are deemed shockable, meaning they can potentially be treated with defibrillation to restore a normal heart rhythm. The rhythms classified as shockable include ventricular fibrillation and pulseless ventricular tachycardia, both of which are critical, life-threatening conditions. Ventricular fibrillation is characterized by chaotic electrical activity in the heart, which prevents the heart from effectively pumping blood. Pulseless ventricular tachycardia, while it may initially produce a significant heart rate, does not generate enough cardiac output to sustain life when there is no detectable pulse. In both cases, the goal of defibrillation is to reset the heart's electrical activity and allow it to resume a coordinated rhythm, thus restoring effective circulation. Other rhythms listed, such as atrial fibrillation, junctional rhythm, asystole, and PEA (pulseless electrical activity), are not treated with defibrillation due to their nature. Asystole represents a flatline on the monitor, indicating no electrical activity, while PEA shows organized electrical activity without effective mechanical heart function. Both require different interventions, like medication and advanced resuscitation techniques, rather than shock. Recogn**

## 9. Which RSI drug is known for having a bronchodilator effect?

**A. Etomidate**

**B. Rocuronium**

**C. Succinylcholine**

**D. Ketamine**

**Ketamine is recognized for its dual role as both an anesthetic and a bronchodilator. This property makes it particularly beneficial in situations involving patients with reactive airway diseases, such as asthma or chronic obstructive pulmonary disease (COPD). When administered, ketamine can help relax the bronchi, thus improving airflow in the lungs, which is advantageous during rapid sequence intubation (RSI) when airway management is critical. This bronchodilatory effect is attributed to ketamine's action on the N-methyl-D-aspartate (NMDA) receptor and its influence on the sympathetic nervous system, potentially causing increased bronchial smooth muscle relaxation. Therefore, when considering an RSI drug that can also support respiratory function in certain patients, ketamine stands out for its efficacy in providing both sedation and bronchodilation.**

## 10. What is the recommended defibrillation dose for pediatric patients in PALS?

**A. 1 J/kg**

**B. 2 J/kg**

**C. 3 J/kg**

**D. 4 J/kg**

**In pediatric advanced life support (PALS), the recommended defibrillation dose for cardioversion in pediatric patients is 2 joules per kilogram (J/kg). This dosing strategy is based on pediatric resuscitation protocols developed to optimize the effectiveness of defibrillation while minimizing potential harm. The use of a dose of 2 J/kg is essential because it provides adequate energy to achieve successful defibrillation by effectively depolarizing the myocardial cells without being excessively high, which could cause additional cardiac injury or complications. As a patient's body weight is taken into account, this approach ensures that children receive an appropriate amount of energy correlated with their size. In addition to achieving effective defibrillation, the 2 J/kg guideline reflects the research and clinical observations on pediatric resuscitation practices that emphasize safety and efficacy in treating arrhythmias in younger patients. This helps healthcare providers maintain a standardized approach in managing cardiac emergencies in children, aligning with current research and consensus guidelines in emergency medicine.**