Critical Care Medicine Examination Sample Items

1. In a patient without cardiac disease, depressed myocardial function in sepsis is **MOST** likely to be manifested by a decrease in which of the following?

   A. Coronary blood flow  
   B. Left ventricular end-diastolic volume  
   C. Left ventricular stroke work

2. Which of the following pharmacokinetic and dynamic parameters are **MOST** likely to account for improved effectiveness of beta-lactam antibiotics?

   A. Duration of drug concentration greater than mean inhibitory concentration  
   B. Peak drug concentration  
   C. Trough drug concentration

3. A 49-year-old man with acute renal failure is receiving continuous venovenous hemodialysis. Serum potassium concentration is 5.8 mEq/L. Increasing which of the following is **MOST** likely to increase potassium clearance in this patient?

   A. Dialysate flow rate  
   B. Rate of fluid replacement  
   C. Ultrafiltration rate

4. A 39-year-old woman is brought to the emergency department by ambulance after being found unconscious. She has a history of major depressive disorder. Temperature is 37°C, blood pressure is 130/70 mmHg, heart rate is 120 bpm, and respiratory rate is 22/min. The patient is comatose, and her pupils are fixed and dilated. Glasgow Coma Scale score is 5. Laboratory studies of serum show:

   | Sodium   | 134 mEq/L |
   | Chloride | 110 mEq/L |
   | Potassium| 4.8 mEq/L |
   | Bicarbonate| 5 mEq/L |
**Arterial blood gas analysis shows:**

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<tbody>
<tr>
<td>PaO2</td>
<td>380 mmHg</td>
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<tr>
<td>PaCO2</td>
<td>32 mmHg</td>
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<td>pH</td>
<td>6.9</td>
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Measurement of which of the following serum concentrations is the **MOST** appropriate next step to confirm the diagnosis?

A. Ethanol  
B. Methanol  
C. Salicylate

5. A 70-kg man with a history of COPD and ischemic heart disease is admitted to the ICU for management of community-acquired pneumonia. He receives mechanical ventilation for one week. While undergoing a spontaneous breathing trial, he immediately develops wheezing, tachycardia, and hypotension. Which of the following is the **MOST** likely cause of these clinical findings?

A. Decreased FRC  
B. Increased left ventricular afterload  
C. Increased pulmonary vascular resistance

6. An unresponsive 59-year-old woman is admitted to the ICU following a motor vehicle collision. Ten minutes after ICU arrival, she develops hypotension with a blood pressure of 82/52 mmHg. The following bedside transthoracic echocardiography parasternal long axis views are obtained:  


Administration of which of the following medications is **MOST** appropriate?

A. Epinephrine  
B. Milrinone  
C. Phenylephrine
Answer Key

1. C
2. A
3. A
4. B
5. B
6. C