

JT Respiratory Case Study Answers

1. Interpret JT's latest set of ABGs.

JT has respiratory acidosis, reflected by the elevation in PaCO₂, with hypoxemia, reflected by the PaO₂ of 54%. ETCO₂ values average 2 to 5 mmHg less than the PaCO₂ in those with normal lung and cardiac function; JT's value is 20 mm less.

2. Describe each of JT's ventilator settings and the rationale for the selection of each.

Tidal volume is the volume of inspiratory flow delivered; the average is 6 to 8 mL/kg. The minimal amount should be used to minimize the risk of barotrauma; at 75 kg, his tidal volume should be approximately 450. In AC mode, the ventilator delivers a preset tidal volume at a preset frequency. For him, this is 16 breaths per minute. If he initiates a spontaneous breath, the preset tidal volume is delivered. PEEP is positive airway pressure applied during expiration to keep the alveoli open. The FIO₂ is the concentration of oxygen being delivered to him.

3. After reviewing JT's ABG results, the provider increases the PEEP from 5 cm H₂O to 8cm H₂O. Why would this be necessary and what is the expected outcome associated with this action?

Progressive increases in pressures may be required to deliver ventilation due to worsening lung compliance. As the lungs become less compliant because of decreased surfactant, pulmonary edema, and atelectasis, higher airway pressures become necessary to inflate "stiff" lungs. By increasing PEEP, JT's oxygen level should increase & Co₂ level decrease.

4. Based on the assessment data, what are the nursing priorities for JT's?

The priorities for JT are maintaining the airway, providing adequate oxygenation, and supporting hemodynamic function. In addition, adequate nutrition, comfort, prevention of VAP and skin breakdown

5. What measures should be a part of JT's care to prevent complications?

Assess patient's room for safety supplies, Assess respiratory status & *vital signs* Q 1-2 hours, If on IV sedation - Assess level of sedation q hour using appropriate scale, Use alternate communication methods, Monitor labs, Review chest x-ray/results, Educate patient and family, Provide calm and relaxing environment, Assess skin for breakdown, Ventilator Acquired Pneumonia (VAPS) Bundle

6. What measures should be part of JT's care to promote respiratory function?

Perform a thorough respiratory assessment frequently. Monitor ABGs for progression of hypoxemia, hypercapnia, and respiratory acidosis. Monitor EtCO₂ levels. Suction him as needed to clear ETT. Elevate the head of the bed. Implement strict infection control measures (strict hand washing, sterile technique during suctioning, and frequent mouth care and oral hygiene) and a VAPs protocol.

7. List three potential adverse complications with mechanical ventilation.

Three potential complications include ventilator-associated pneumonia, barotrauma caused by excesses in peak airway pressure or increased peak end expiratory pressure, volutrauma from excessive tidal volume, and O₂ toxicity when the FIO₂ exceeds 50% for more than 24-48 hours, accidental extubation, fluid retention, decreased BP related to PEEP, stress ulcer, anxiety, aspiration

8. List 3 benefits of using IV sedation and analgesic medications while JT is on mechanical ventilation?

Decreased oxygen demand, patient tolerates vent better in many cases,

9. What would be signs JT is ready for weaning and possible extubation?

breathing spontaneously, supporting adequate oxygenation, maintaining normal hemodynamics, original reason for intubation resolved, stable ABG's

10. If JT progresses to extubation (ETT removal) what assessment findings would indicate that he is not tolerating extubation

↑ RR, ↓ O2 sat, ↓ RR, Respiratory distress, LOC change, arrhythmias?