

Zero to Hero

The Crashing Ventilated Patient Handout

- I. Three scenarios to consider in the crashing ventilated patient**
 - a. The peri-intubation hemodynamic collapse
 - b. The patient who experiences both hemodynamic and ventilatory collapse
 - c. The hemodynamically stable patient with ventilator dysfunction

- II. The Peri-Intubation Hemodynamic Collapse**
 - a. Critically-ill patients requiring intubation are at increased risk for hemodynamic collapse
 - i. Reduced intravascular volume
 - ii. Sympathetic output is maxed
 - iii. Organ dysfunction
 - b. Rapid sequence intubation may potentially lead to hemodynamic collapse
 - i. BVM and subsequent mechanical ventilation increases intra-thoracic pressure → reduces preload and cardiac output
 - ii. RSI medications reduce sympathetic tone and can reduce blood pressure
 - c. Tips for intubating critically-ill patients
 - i. Prior to intubation, preload the patient with crystalloids
 - ii. Place arterial line for continuous and accurate blood pressure monitoring (if time and staff permits)
 - iii. Reduce the dose of sedatives during RSI
 - iv. Have IO access nearby should vasopressors be required
 - v. Have vasopressors in the room just in case hypotension occurs
 - vi. Post-intubation → emphasis on analgesia BEFORE sedation
 1. Reduces the need for sedatives with the potential for hypotension

- III. The patient who experiences hemodynamic and ventilator collapse**
 - a. Remember the mnemonic “D.O.P.E.S. like D.O.T.T.S.”
 - i. D.O.P.E.S. → Helps to diagnose the problem
 - ii. D.O.T.T.S. → Helps to treat the problem
 - b. D.O.P.E.S.
 - i. Displaced / Cuff
 - ii. Obstructed tube
 - iii. Pneumothorax
 - iv. Equipment Malfunction
 - v. Stacking (i.e., breath stacking)
 - c. D.O.T.T.S.
 - i. Disconnect the patient from the ventilator
 - ii. O₂ (100%) / BVM → Bag patient on 100%
 - iii. Position → Check endotracheal tube position and function

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- iv. "Tweak" the ventilator → especially if Auto-PEEP is suspected
 - v. Sonogram → Use ultrasound to look for a pneumothorax
- IV. The hemodynamically stable patient with post-intubation ventilator dysfunction**
- a. 100% / Quick Check
 - i. Look for evidence of:
 - 1. The patient "bucking" the ventilator
 - 2. The patient biting the tube
 - 3. Disconnections → Check every connection from the patient to the ventilator
 - b. Focused History, Physical, labs, and imaging
 - i. Who originally intubated?
 - ii. Were there any post-intubation complications?
 - iii. What medications were used pre and post-intubation?
 - iv. Were any procedures performed pre and post-intubation?
 - v. What's the patient's overall fluid balance?
 - vi. What are the current oxygen saturations and EtCO₂ (if available)
 - vii. What was the most recent ABG?
 - viii. Have you looked with ultrasound to look for pneumothorax
 - c. Waveform Analysis
 - i. Is there any evidence of air-hunger?
 - ii. Is there evidence of Auto-PEEP?
 - 1. Perform an end-expiratory hold to determine auto-PEEP
 - d. Respiratory Mechanics
 - i. Evaluating if there the problem is one of resistance or compliance
 - ii. Evaluating the Peak Pressure
 - iii. Evaluating the Plateau Pressure
 - iv. When the difference between the two measures is:
 - 1. Low → The problem is likely one of compliance
 - a. Consider:
 - i. Volume overload
 - ii. Acute lung injury / Acute respiratory distress syndrome
 - iii. Pneumothorax
 - iv. Neuromuscular Dysfunction
 - v. Abdominal Compartment Syndrome
 - 2. High → Problem is likely one of resistance:
 - a. Consider
 - i. Bronchoconstriction
 - ii. Dislodged Tube
 - iii. Kinked / Biting
 - iv. Mucus plug