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
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