My Intubated Patient Is More Hypoxemic... Now What Do I Do?

1) **Check equipment, consider calling the respiratory therapist for help**
   Ensure the following:
   - Patient remains connected to the ventilator circuit and circuit is intact
   - No inadvertent changes $F_iO_2$, PEEP or other settings
   - Endotracheal tube is patent and remains in correct position

   If the ventilator pressure alarm is sounding, consult the card on “The Peak Pressure Has Increased”

2) **Examine the patient and evaluate their interaction with the ventilator**
   - Listen for bilateral breath sounds. If breath sounds are asymmetric, consider pneumothorax or lung collapse and evaluate accordingly
   - If patient is agitated and having repeated peak pressure alarms, administer intravenous fentanyl bolus and consider increasing propofol

3) **Obtain diagnostic studies**
   - Arterial Blood Gas (venous blood gases cannot be used to assess oxygenation)
   - Chest radiograph

4) **Adjust the ventilator to improve oxygenation**
   - The two parameters on the ventilator that address oxygenation are $F_iO_2$ and PEEP
   - Increase $F_iO_2$
   - If this does not resolve the situation, increase PEEP by 5 cm H$_2$O
     - Expect a slow rise in oxygen saturation with increased PEEP
     - May cause paradoxical worsening of oxygenation $\rightarrow$ return to previous PEEP
     - May cause hypotension $\rightarrow$ return to previous PEEP
   - **Call for Help!** if these maneuvers do not resolve the situation. Discuss other strategies with your critical care consultant

5) **Treat reversible causes of hypoxemia if present**
   - Suction the patient to clear any mucus in the endotracheal tube or central airways
   - If chest radiograph reveals lobar or whole lung collapse, start chest physiotherapy
   - If worsening edema pattern on chest radiograph, consider diuresis or new diagnosis of ARDS (see ARDS sheet)

6) **Optimize other factors that affect oxygen delivery**
   - Check hemoglobin and transfuse red blood cells if [Hb] < 7 g/dL
   - Check $S_CO_2$ and call for help if < 60%
   - Review medications for those that can cause pulmonary vasodilation (e.g., calcium channel blockers) as this may worsen ventilation-perfusion matching