J.T., 74-year-old Hispanic male, came to the emergency department (ED) 7 days ago with complaints of shortness of breath. His wife stated that he has a history of hypertension, depression, and chronic obstructive pulmonary disease (COPD). The admission chest x ray revealed dense consolidation of the left lower lobe. An arterial blood gas (ABG) at that time showed ph 7.60, Paco2 29, HCO3 32 , and Pao2 75. He quickly deteriorated and required intubation. He has been in the intensive care unit for 3 days. JT has been married to his wife for 45 years and they live with a daughter and 2 grandchildren. JT and his wife speak English and Spanish. JT weighs 75kg

Current Assessment and tests:

BP 167/98, pulse 112, temp 102.3F, RR 144, O2 sat 72%

Patient localizes to ETT and is intermittently opens eyes, making several attempts to pull ETT

Orally intubated with # 7.5 ETT, taped at 27 cm at teeth

Ventilator settings: Assist control (AC), Tidal volume (TV) 450, Rate 14, Fio2 60%, Peep 5 cm H2O

Breath sounds: decreased bases and bilateral crackles that do not clear after suctioning

Brown, yellow secretions returned with suctioning

Peripheral pulses weak with capillary refill greater than 4 seconds

2+ pitting edema in the bilateral lower extremities

ABG ph 7.31, Paco2 58, Hco 28 , Pao2 54

Chest X-ray reveals diffuse white- out in middle and lower lobes; ETT present with tip above carina; left subclavian central venous catheter is located in the superior vena cava

1. Interpret JT's latest ABG's

   Respiratory Acidosis with partial compensation

   pH acidic, PaCO2 acidic, HCO3 basic, and PaO2 low

2. Describe each of JT's ventilator settings and the rational for the selection of each
   Assist control (AC) setting: a full support mode that requires the least amount of patient effort. It is used for very sick patients. JT is on this setting because he was struggling to breathe and was not initiating breaths.
   Tidal Volume (TV) setting: Tidal Volume is 6-8 mL/ kg IBW. JT is in Adult Respiratory Distress Syndrome (ARDS) and has a low tidal volume. The Vt setting will help prevent trauma to his lungs.
   Rate 14: this means that the respiratory rate on the vent is set to 14. If it were at 12, the vent would be doing all of the work for JT. It is set 14 so the vent will do most of the work but still allow some space for JT to attempt to trigger his breaths.
   FIO2: The fraction of inspired oxygen. JT is being resistant to FIO2, so that is why it is set on his ventilator settings.
   PEEP: Positive end-expiratory pressure. Normal is 5-10 cm H2). Positive end expiratory pressure is needed to increase the opening of JT's collapsing alveoli and treat the resistant hypoxemia.

3. After JT's ABG results the provider increases the PEEP from 5 cmH2O to 8cm H2O. Why would this be necessary and what is the expected outcome with this action?
   JT's PaO2 is 54, while normal is 80-100. The provider increased the PEEP from 5 cm H2O to 8 cm H2O to increase his PaO2 level. The expected outcome is for his PaO2 level to increase and it is necessary to improve his hypoxemic state.

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

   I would prioritize JT's safety and restrain him because he is attempting to pull out his ETT, which could cause injury. I would also be concerned about the amount of fluid building in his lungs since suctioning is not being effective, so that would be a priority to me as well. I would make it a priority to have everything that is needed for his ETT in his room as well (suction, BVM). Oral care is also a priority.

5. What measures should be part of JT's care to prevent complications?
   Always have what you need in the room like I mentioned. Restraints would also be needed to prevent complications. JT should be on enoxaparin or have SCD's on to prevent DVT's while he is immobile. He will need to be turned q 2 hrs and his skin needs to be assessed for skin breakdown. Oral care will need to be done every 4 hours to prevent bacteria from getting into lungs. Sedation will also be needed.

6. What safety measures should you implement to protect JT while he is mechanically ventilated?
   Restraints will be needed for JT's safety. JT's side rails needed to be up and fall precautions will need to be put in place if he is not sedated.

7. List 3 potential complications with mechanical ventilation.
   1. aspiration
   2. oxygen toxicity
   3. barotrauma

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

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

10. An hour after extubation, JT shows signs that he is not tolerating being off of the ventilator. What would be some of these signs?