**ICU Lectures: Mechanical ventilation**

1. **Indications for intubation**
   1. Hypoxia
   2. Hypercarbia
   3. Work of breathing/expected clinical course
   4. Airway protection/mental status
2. **Peri-intubation care**
   1. Pre-intubation
      1. Consider timing, location, personnel for safest intubation
   2. Post-intubation
      1. Stat CXR and blood gas
      2. Sedation/analgesia
3. **Ventilator settings**
   1. Mode: AC, PSV, SIMV
   2. Cycling: Volume, Pressure, PRVC
   3. Major settings: TV/PC, RR, FIO2, PEEP
   4. Other settings: Insp time, flow, sensitivity
4. **Goals of mechanical ventilation**
   1. Goals of oxygenation
      1. 02 saturation 88-92%
      2. FIO2 <60%
      3. Avoid hemodynamic compromise
   2. Goals of ventilation
      1. Acceptable PCO2 and Ph
      2. Synchrony, avoidance of Auto-Peep
   3. Lung protection
      1. Tidal volume 6cc/kg IBW
      2. Plateau pressure <30
5. **Liberation**
   1. Criteria
      1. Initial pathology (need for intubation) resolved/resolving
      2. Hemodynamically stable
      3. Acceptable FIO2, PEEP, RR, MV
      4. Minimal secretions
      5. Adequate mental status
   2. Spontaneous breathing trial (SBT)
      1. With sedation holiday (SAT)
      2. May or may not be done in AM by protocol
      3. 30–60 minutes of:
         1. Pressure support
         2. CPAP
         3. T piece
      4. Criteria for success
         1. RSBI/Tobin index <105, preferably <80
         2. Tidal volume >325, FVC >1000
         3. Minute ventilation <15L
         4. NIF >30 cmH2O
         5. Cuff leak
         6. No distress, tachypnea, tachycardia, hypertension, hypoxia
         7. ABG if desired
      5. Extubation order, pulmonary toilet (IS, flutter valve), reconcile orders
         1. Extubate to:
            1. NC
            2. BIPAP
            3. HFNC

References (available at: **http://critcon.org/prince-georges-icu-resident-resources**):

1. ARMA Study. The ARDS Network. Ventilation with Lower Tidal Volumes as Compared with Traditional Tidal Volumes for Acute Lung Injury and the Acute Respiratory Distress Syndrome. N Engl J Med 2000; 342:1301-1308
2. Thompson B.T.Chambers R.C.Liu K.D. Acute Respiratory Distress Syndrome. N Engl J Med. 2017; 377:562-572
3. Slutsky. Ventilator-Induced Lung Injury. NEJM 2013;, 369:2126-36.