   i. assessment of adequacy of ventilation and change in ventilatory status in response to treatment
   ii. differentiating between severe bronchospasm (shark fin waveform) and other causes of respiratory distress (normal waveform, pulmonary edema)
   iii. hypotension due to sepsis or unclear cause (metabolic acidosis with/without compensatory respiratory alkalosis)
   iv. status epilepticus to evaluate ventilatory and acid/base status
   v. evaluation for acidosis in patients with altered mental status and potential diabetic ketoacidosis (metabolic acidosis)

5. Bag-valve-mask (BVM) ventilation (for cardiac arrest patients see Cardiac Arrest Guideline):
   a. Appropriately sized masks should completely cover the nose and mouth and maintain an effective seal around the cheeks and chin
   b. Ventilations should be delivered with only sufficient volume to achieve chest rise. Overventilation is undesirable
      i. In children, ventilating breaths should be delivered over one second, with a two second pause between breaths
   c. Ventilation rate:
      i. Adult
         1. Support spontaneous respirations if the patient is hypoventilating
         2. For apnea, provide one breath every 6 seconds adjusting based on pulse oximetry and digital capnometry or capnography (with the goal of 35–45 mmHg)
      ii. Pediatric – infant/child
         1. Support spontaneous respirations if the patient is hypoventilating
         2. For apnea, provide 1 breath every 2–3 seconds adjusting based on pulse oximetry and digital capnometry or capnography (with the goal of 35–45 mmHg)
6. PEEP improves oxygenation or decreases risk of developing hypoxemia, by increasing functional residual capacity (FRC), and tidal ventilation and may assist in meeting airway goals by decreasing intrapulmonary shunting of blood and better matching perfused lung to ventilated lung tissue, thus improving arterial oxygenation. It does not open fully collapsed alveoli but re-expands partially collapsed ones. It does not decrease extravascular lung water but redistributes it
   a. Higher levels of PEEP are particularly useful in patients with acute respiratory distress syndrome (ARDS)
   b. PEEP should be increased slowly by 2–3 cmH_20 from 5 cmH_20 to a max of 15 cmH_20 closely monitoring response and vital sign changes
   c. Excessive PEEP over distends alveoli, increases dead space and work of breathing, reduces lung compliance, and compresses alveolar capillaries, reducing oxygenation and risking pulmonary barotrauma
   d. Increased intrathoracic pressure can progressively decrease cardiac output and is most notable when PEEP is greater than 15 cmH_20. The higher the level of PEEP (over 5 cmH_20), the more likely the patient will experience a variety of adverse consequences, both ventilatory and hemodynamic
7. Noninvasive ventilation (NIV) (e.g., CPAP or BiPAP):
   a. NIV goals of therapy will vary based on patient presentation and history. More support than is needed to relieve symptoms or “normal” is not necessarily better in these patients. Goals of care may include:
      i. Decreased air hunger