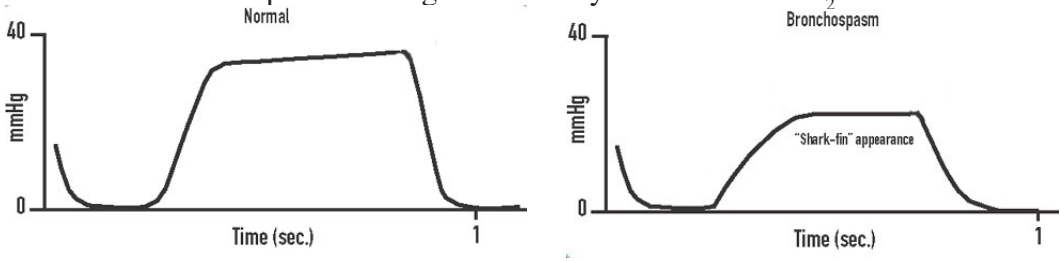
4. Technique
   a. Prepare needle insertion site with antiseptic solution or alcohol.
   b. Select the longest 14G IV catheter for adult patients. A shorter 14G IV catheter may be chosen for pediatric patients.
   c. Palpate the sixth rib in the midaxiallary line for the lateral approach. This is generally at the nipple line. For the alternative site, palpate the third rib at the mid-clavicular line.
   d. Insert the needle perpendicularly just over the upper edge (towards the head) of the rib. Ensure the needle passes over the upper edge of the rib as opposed to lower edge where the intercostal vessels and nerves lie.
   e. Advance the needle. A 'pop' may be felt as the pleural space is entered and air is encountered.
   f. Advance the catheter into the chest and then withdraw the needle.
   g. Secure the catheter in place with tape, being sure not to block or kink the catheter.
   h. Continue to reassess patient. If no improvement, consider persistent tension pneumothorax requiring no more than one additional catheter placement.

K. Waveform Capnography - End Tidal CO_2 Monitoring [ALS]
1. Capnography is a noninvasive method for monitoring the level of carbon dioxide in exhaled breath, to assess a patient's ventilatory status. Capnography is also an indirect measure of circulatory status/cardiac output of the patient. End Tidal CO_2 Monitoring on the LifePak 15 provides both a numeric $ETCO_2$ value and a waveform. Normal $ETCO_2$ is 35 - 45. End Tidal CO_2 monitoring can be performed with either the nasal cannula or ET Tube connector devices.
2. There is a good concordance with the partial pressure of CO_2 in the blood and the $ETCO_2$. This can help provide a quicker detection of acute respiratory events than pulse oximetry would otherwise indicate.
3. Indications : Optional
   a. Respiratory assessment - By physical exam alone, it is not always clear if a patient is having an exacerbation of asthma/COPD, CHF or a cardiac presentation. In obstructive respiratory diseases (asthma/COPD), the $ETCO_2$ waveform will have a sloping upward plateau similar to a shark's fin appearance. In cardiac disease ("cardiac wheezing"), there will be a normal plateau along with a likely increased $ETCO_2$ value.



   b. CPAP adjustment - $ETCO_2$ can assist in determining the most effective level of PEEP for a patient requiring CPAP. As PEEP increases, oxygenation increases and the $ETCO_2$ value will decrease. Too much PEEP can be detrimental however, worsening oxygenation. As this point is reached, the $ETCO_2$ value will increase and the pulse oximetry will decrease.
   c. To measure quality of chest compressions - $ETCO_2$ is reflective of the cardiac output achieved while a patient is receiving chest compressions. While no specific value can be obtained in any specific patient, a decrease in $ETCO_2$ over a period of chest compressions should draw concern to proper chest compression technique, specifically rate and depth.
4. Indications : Mandatory

a. Airway Maintenance Confirmation - All patients having their airway and breathing maintained by ALS with either a BVM, Supraglottic airway, or Endotracheal Intubation shall have $ETCO_2$ monitored to ensure successful airway control, both initially and throughout the duration of care of that patient.
b. Assessment of Sedation - In patients sedated by drugs or alcohol, or those sedated by HFD narcotic or benzodiazepine therapy, $ETCO_2$ monitoring provides a gauge of their ventilatory status. With an $ETCO_2$ within normal values, the patient is in less respiratory compromise than the patient whose $ETCO_2$ is elevated or becoming progressively elevated indicating hypoventilation. This information can be used as a guide to therapy of a patient with regard to both nalaxone administration as well as potential repeat dosages of narcotics or benzodiaepines.
c. Assessment of perfusion status in patients with ventricular asssist devices.

L. Neonatal / "Newly Born" [BLS/ALS]
1. Bulb suctioning is indicated immediately following birth for those neonates who have obvious obstruction to spontaneous breathing or who require BVM ventilations.
2. Deep suctioning of the airway with an endotracheal tube is no longer recommended. Standard bulb suctioning alone is recommended to remove any secretions present.
3. Because the neonate is an obligate nose breather, it is advisable to suction once through each nostril to ensure patency of the upper airway.

M. Oxygen Therapy Guideline [BLS/ALS]
1. The intent of the Oxygen Therapy Guideline is to provide an individualized approach to oxygenation to the patient. Taking into account vital signs, pulse oximetry and condition of the patient, the guideline provides patient-focused means of oxygenation.
2. The use of Pulse Oximetry is required for the guideline. If Pulse Oximetry is unobtainable, utilize clinical judgement to administor O2 via NC or NRB as required.
3. When a specific guideline indicates additional respiratory treatment (i.e. nebulization, CPAP), that treatment replaces, or is utilized in addition to, the oxygen therapy indicated here.