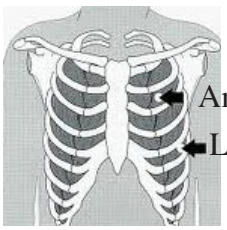
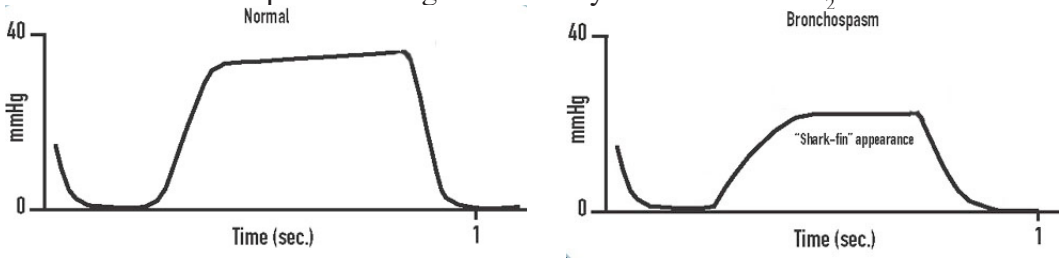
a. Assure patent airway.
b. Perform appropriate patient assessment, including obtaining vital signs, pulse oximeter (SpO_2) reading and cardiac rhythm.
c. Prior to initiation of the mask CPAP treatment, the patient must be informed of the purpose of the mask and cooperation ensured.
d. The Mask CPAP System components are assembled (CPAP mask, tubing, pressure relief valve) and connected to the oxygen cylinder.
e. Connect the pressure tubing and pressure relief valve to the connection port.
f. Turn on gas supply.
g. Verify controls are set (FiO_2).
h. Hold the mask in place as the patient adjusts to the ventilatory support. With the mask in place, modify the CPAP System settings to optimize the patient's ventilatory status. Titrate to effect, generally a range of 5 - 10 cm H_2O of PEEP in adults and 3 - 5 cm H_2O of PEEP in pediatric patients.
i. Encourage the patient to breathe deeply.
j. Adjust the mask for comfort and to minimize air leak especially about the eyes.
k. Periodic evaluation of the patient's status should be coupled with ongoing vital sign and pulse oximetry measurements. Consider usage of $ETCO_2$ monitoring.
l. If patient's anxiety level prevents patient from tolerating the device, consider contacting on-line medical control for sedation.
m. Monitor and document the patient's respiratory response to the treatment.
n. Continue to coach patient to keep mask in place and readjust as needed.
o. For patients requiring nebulized medication, utilize the T-Piece to administer nebulized medicine concurrently with CPAP.

J. Needle Thoracostomy [ALS]
1. Indication
a. Emergent treatment of a clinically unstable patient with a tension pneumothorax.
b. A tension pneumothorax is the progressive collection of air in the pleural space with subsequent increasing pleural pressures and respiratory compromise.
c. Treatment of a tension pneumothorax should begin as soon as it is clinically recognized.
2. Relative contraindications
a. Insertion of needles through an area of infection. Select alternative insertion site.
b. In patients being manually ventilated, use extreme caution. If the presumption of tension pneumothorax is incorrect, insertion of the needle may create a pneumothorax which, with positive pressure ventilation, can convert into a tension pneumothorax.
3. Insertion Site
a. Primary site: Lateral approach, patient in a supine position with the head of the stretcher elevated 30° and the patient's arm extended above the head. Insertion site is the fourth/fifth intercostal space in the midaxillary line.
b. Alternative site: Anterior approach, patient in a supine position with the head of the stretcher elevated 30°. Insertion site is the second intercostal space in the midclavicular line.



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