PLEURAL MANOMETRY

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DEFINITION:

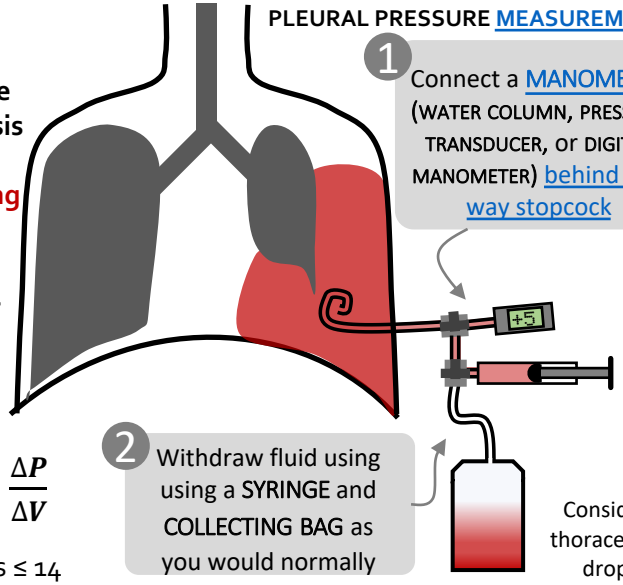
Measurement of Intrapleural Pressures and **Pleural Elastance** during **therapeutic thoracentesis** can be used to identify pleural pathologies such as **trapped lung** and **entrapped lung** and to predict successful pleurodesis. It *may* also reduce the risk of **re-expansion pulmonary edema**.

INTERPRETATION:

$$\text{Elastance} = \frac{1}{\textit{Compliance}} = \frac{\Delta P}{\Delta V}$$

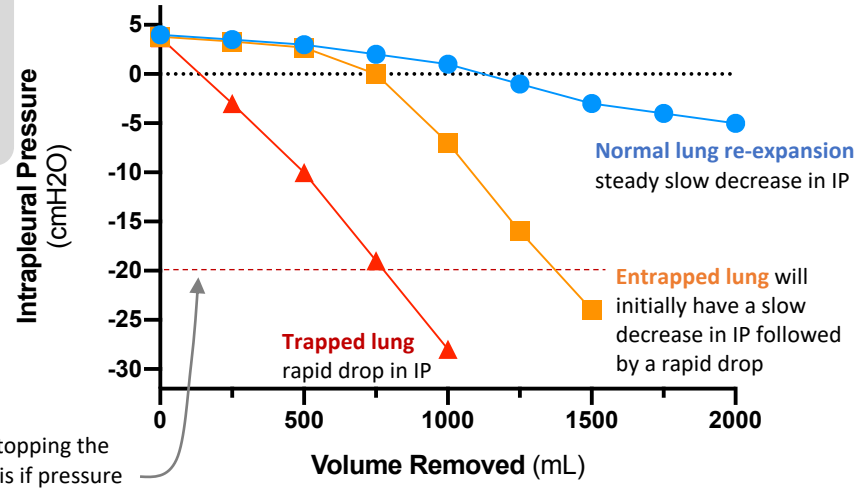
- Normally Pleural Elastance is ≤ 14 cmH2O/L.
- Pleural elastance > 14.5cmH2O/L suggests trapped lung.
- Pleural elastance < 18 cmH2O/L predicts successful pleurodesis

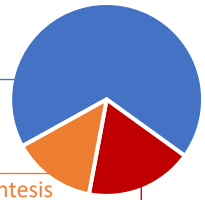
PLEURAL PRESSURE MEASUREMENT:



1. Connect a MANOMETER (WATER COLUMN, PRESSURE TRANSDUCER, OR DIGITAL MANOMETER) behind a 3-way stopcock
2. Withdraw fluid using using a SYRINGE and COLLECTING BAG as you would normally
3. Measure the INTRAPLEURAL PRESSURE at ***end-expiration*** intermittently (e.g. every 250cc) as fluid is removed by thoracentesis and calculate PLEURAL ELASTANCE

Consider stopping the thoracentesis if pressure drops < 20 cmH_2O





Normal re-expansion
occurs in the majority of cases

15-20% of thoracentesis

10-15% of cases

Differentiate **Entrapped Lung** (partially inflatable) and **Trapped Lung** (un-inflatable)

Pleural elastance < 18 cmH2O/L (after 500 mL withdrawn) implies that the visceral and parietal pleura are opposed, and suggesting a ***successful response to pleurodesis*** in malignant effusions.

Avoid ***excessive negative pressure*** (<-20 cmH2O) during thoracentesis, as this can cause **re-expansion pulmonary edema**. However, the utility of pleural manometry to predict re-expansion pulmonary edema is controversial.

	Entrapped Lung	**Trapped Lung**
PATHOLOGY	**Entrapped Lung** is an ***active*** **inflammatory process.** There is typically partial lung re-expansion	**Trapped Lung** is a ***resolved*** **inflammatory process** with **residual pleural fibrosis**, which will prevent lung re-expansion
FLUID	**Exudative**	**Transudatative** (usually)
MANOMETRY FINDINGS	**Bimodal pressure change** (initially slow pressure change, then rapid drop) **Normal or increased elastance**	**Linear pressure change** (rapid drop in pressure) **Increased elastance** (>14.5 cmH2O/L)
TREATMENT	**Treat the cause; drain the effusion dry if possible**	**Remove the rind preventing lung expansion** *(decortication)*

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