

# *Tracheostomy and Chest tube*

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# *Definition*

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- An artificial ( usually ) surgically created airway fashioned by making a hole in the anterior wall of the trachea and the insertion of a tracheostomy tube, which may or may not be permanent.

# *Types of surgical airway*

*1- Elective Tracheostomy*

*2- Cricothyroidotomy ( Mini Tracheostomy )*

*3- percutaneous Dilatational Tracheostomy*



# *Indications*

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- . Upper Airway Obstruction.
- . Pulmonary Ventilation.
- . Pulmonary Toilet.
- . Elective Procedure.

# *Upper Airway Obstruction*

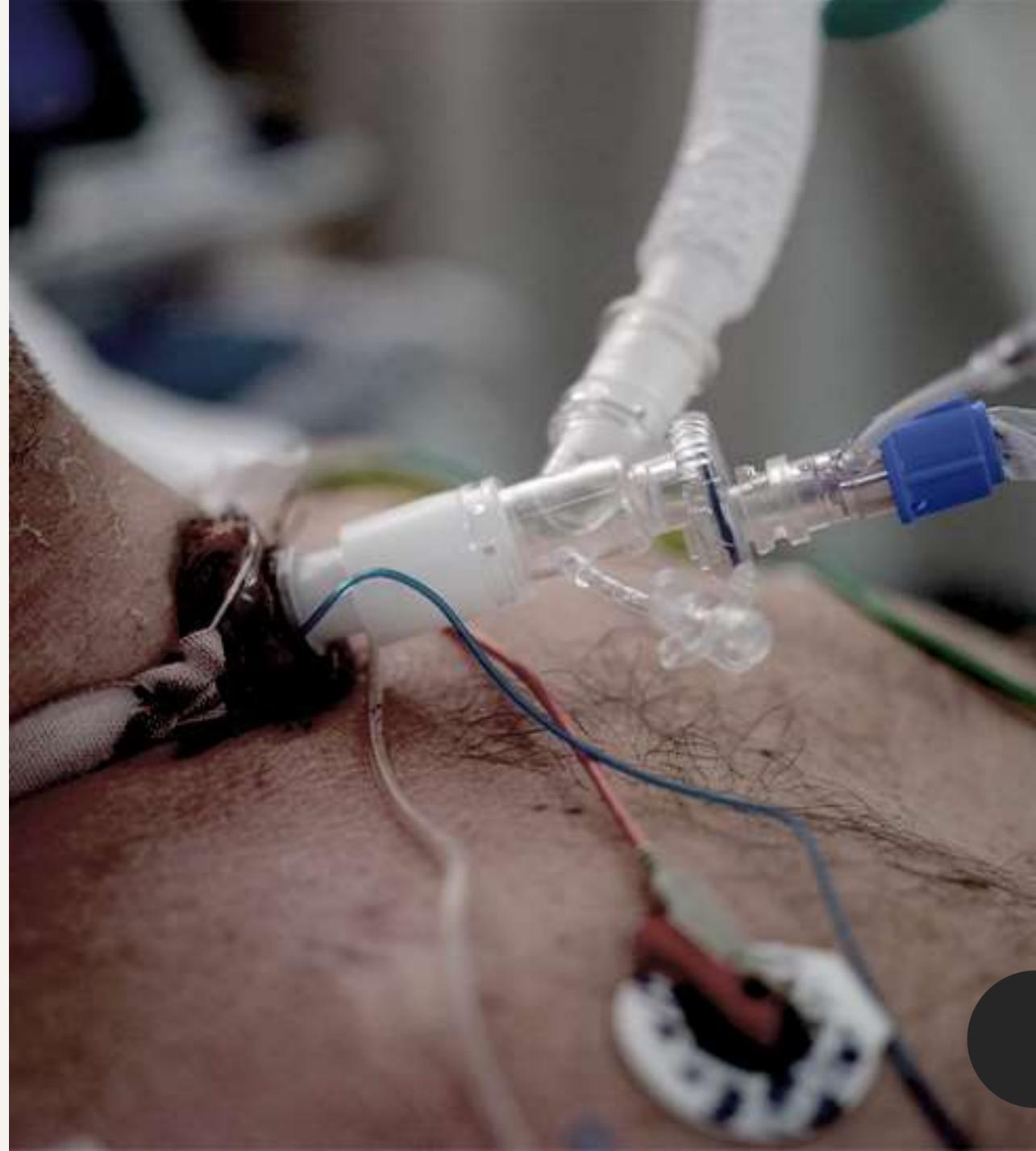
- Trauma
- Foreign body
- Infections
- Malignant lesions
- Vocal cord palsy



# *Pulmonary Ventilation*

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- Tracheostomy should be performed in a patient still requiring ventilation through an endotracheal tube for more a one week



# *Pulmonary toilet*

*Those who cannot cough and clear their chest.*

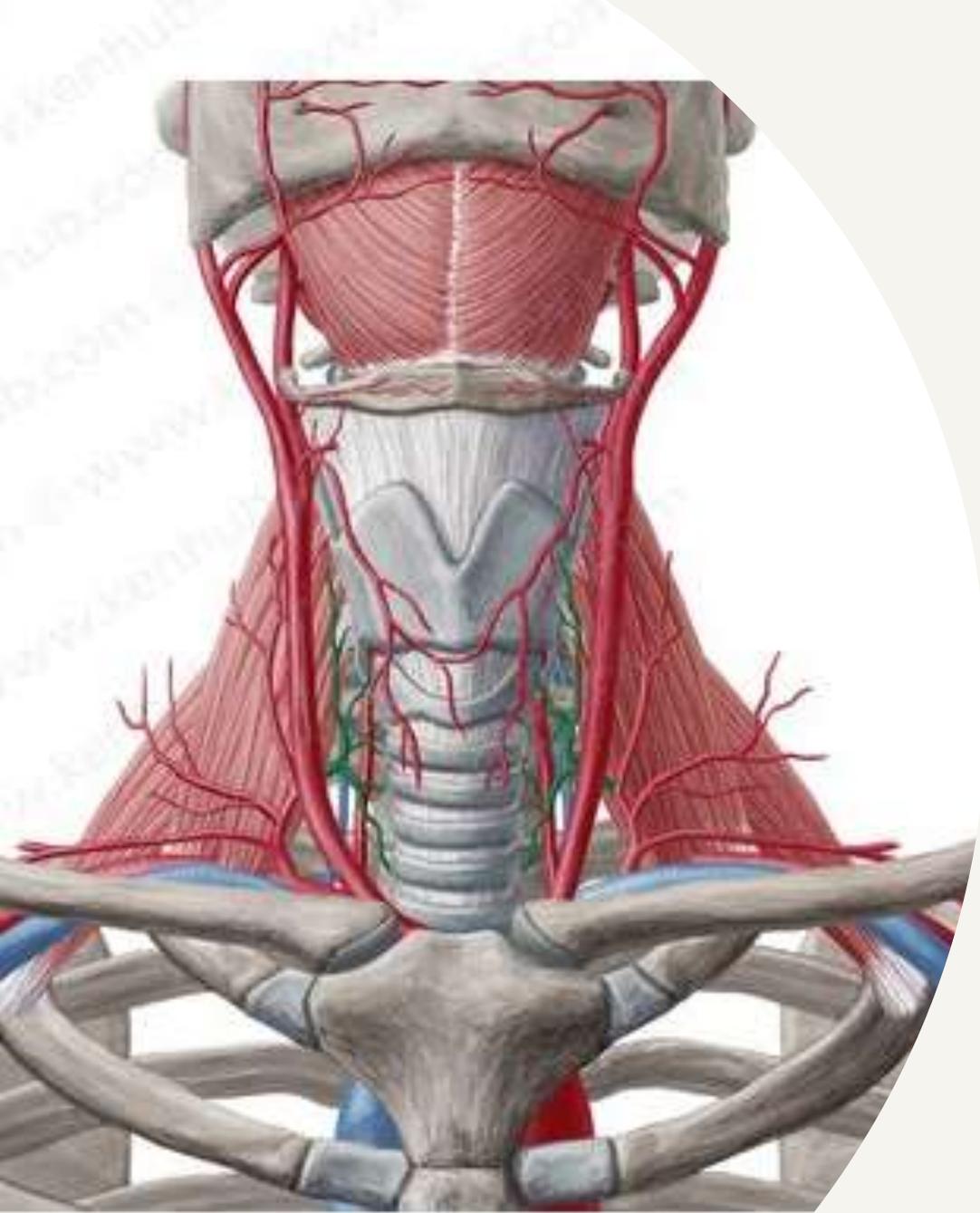
*Prevent aspiration by low-pressure high-volume cuff tracheostomy tube.*



# *Elective procedures*

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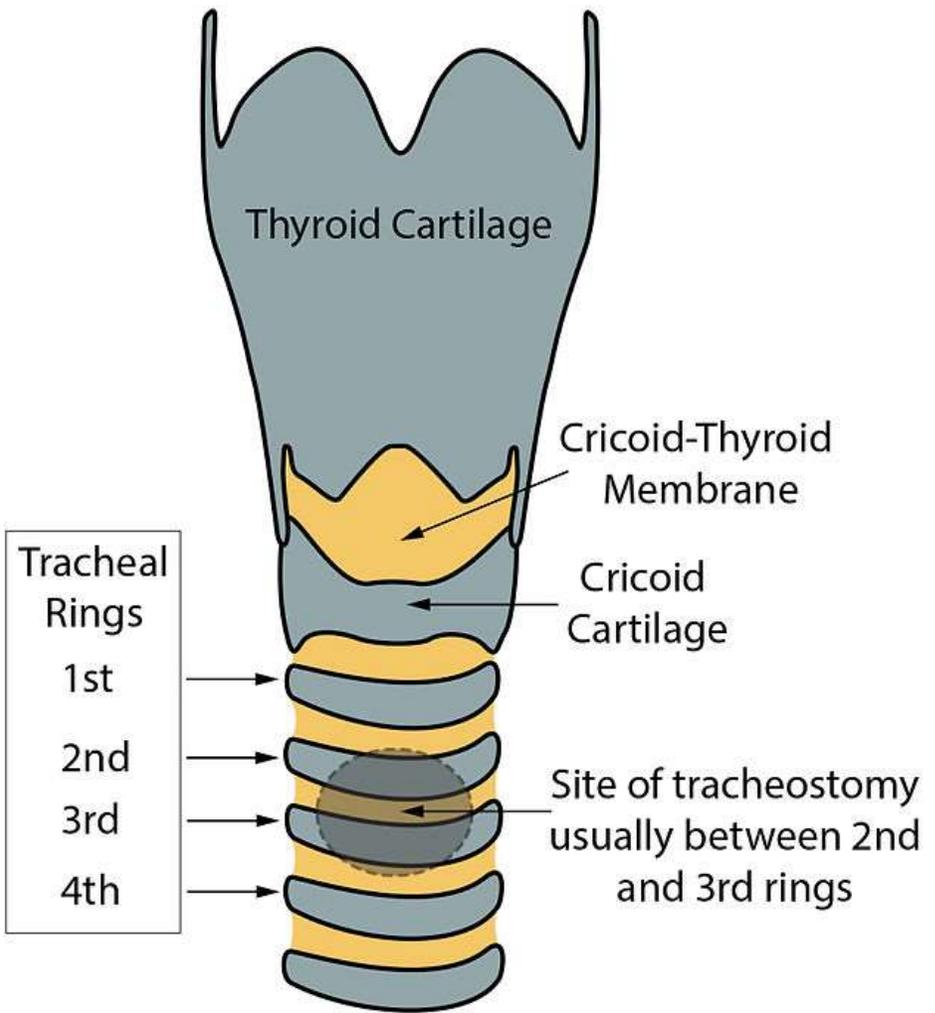
- For major head and neck operations.



# *anatomy*

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- Trachea lies in midline of the neck extending from cricoid cartilage C6 superiorly to the tracheal bifurcation at the level of sternal angle of Luis T4.
- Comprises of 16-20 C shaped cartilage rings.
- Length 10-12 cm.
- Diameter 15-20 mm.



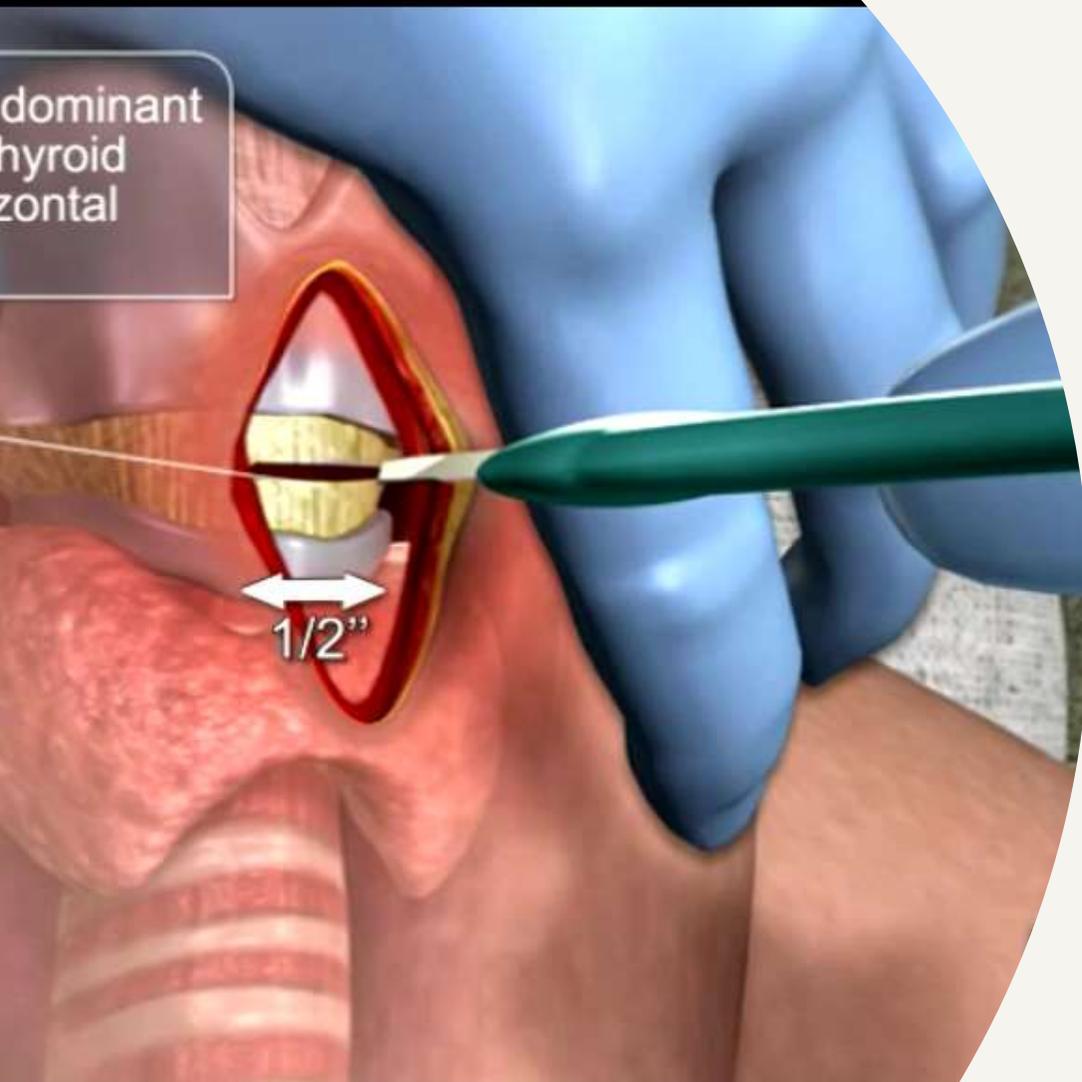
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- Where do cricothyroidotomy insert?
  - Where do tracheostomy insert?
  - What are the layers anterior the trachea?



- 1- skin
  - 2- subcutaneous tissue and fascia
  - 3- anterior jugular vein
  - 4- pretacheal muscle
  - 5- thyroid isthmus
  - 6- pretracheal fascia
  - 7- trachea
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dominant  
thyroid  
horizontal



## *Cricothyroidotomy ( mini tracheostomy )*

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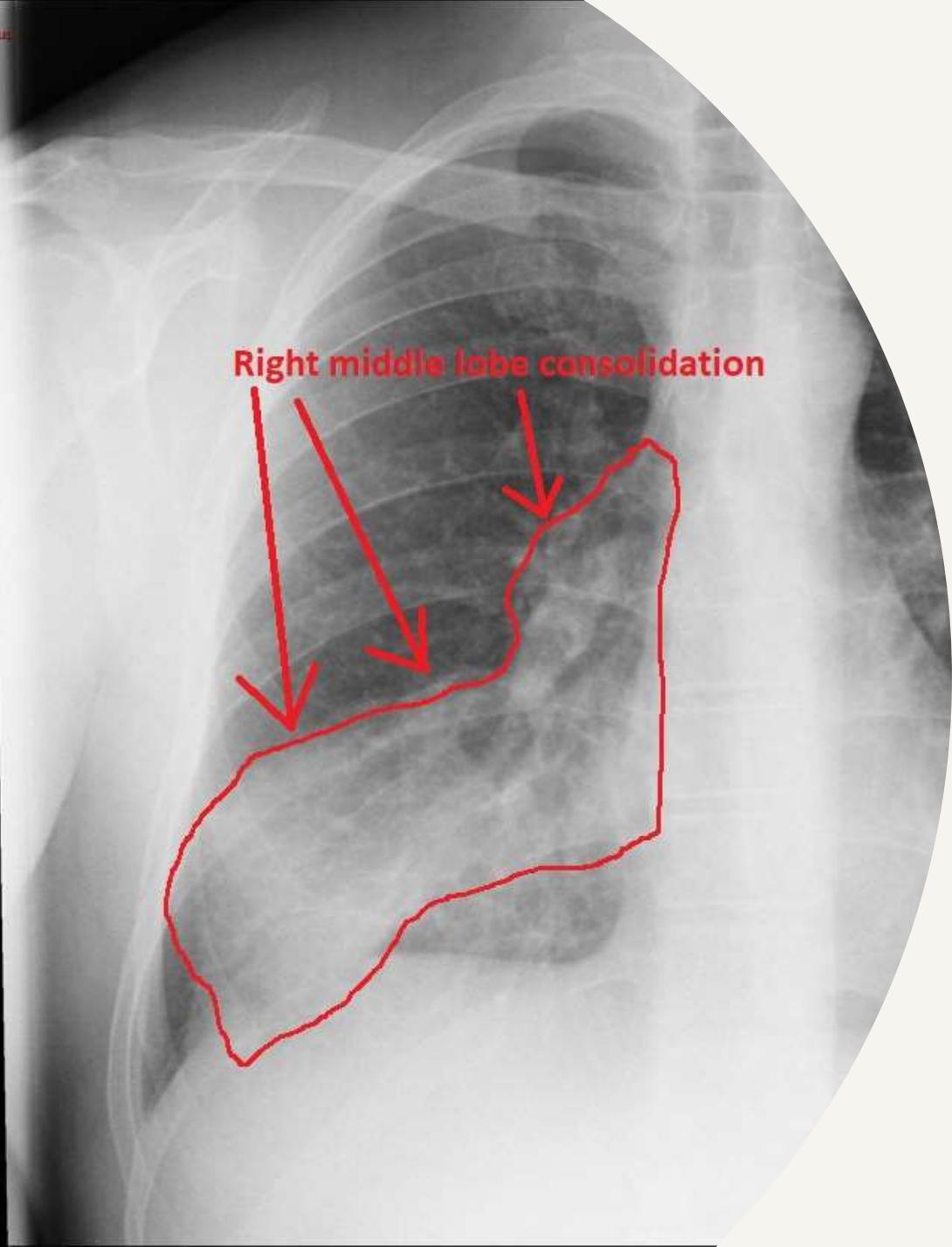
- Transverse incision over the cricothyroid membrane.



## *Percutaneous dilatational tracheostomy*

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- ICU bed side tracheostomy.
- Use of guide wire and dilators.
- May be under the vision of bronchoscope through endotracheal tube.
- Less time, less expensive.
- Not suitable for thick neck and in emergency.



# *Complications of tracheostomy*

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Intraoperative complications:

- Loss of airway
- Bleeding and injury to big ( major ) vessels
- Injury to tracheoesophageal wall
- Pneumothorax
- Aspiration

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### Early complications

- Bleeding and local hematoma
- Tracheostomy tube obstruction and desaturation
- Tracheostomy tube displacement
- Infection
- Surgical emphysema





Late complications:

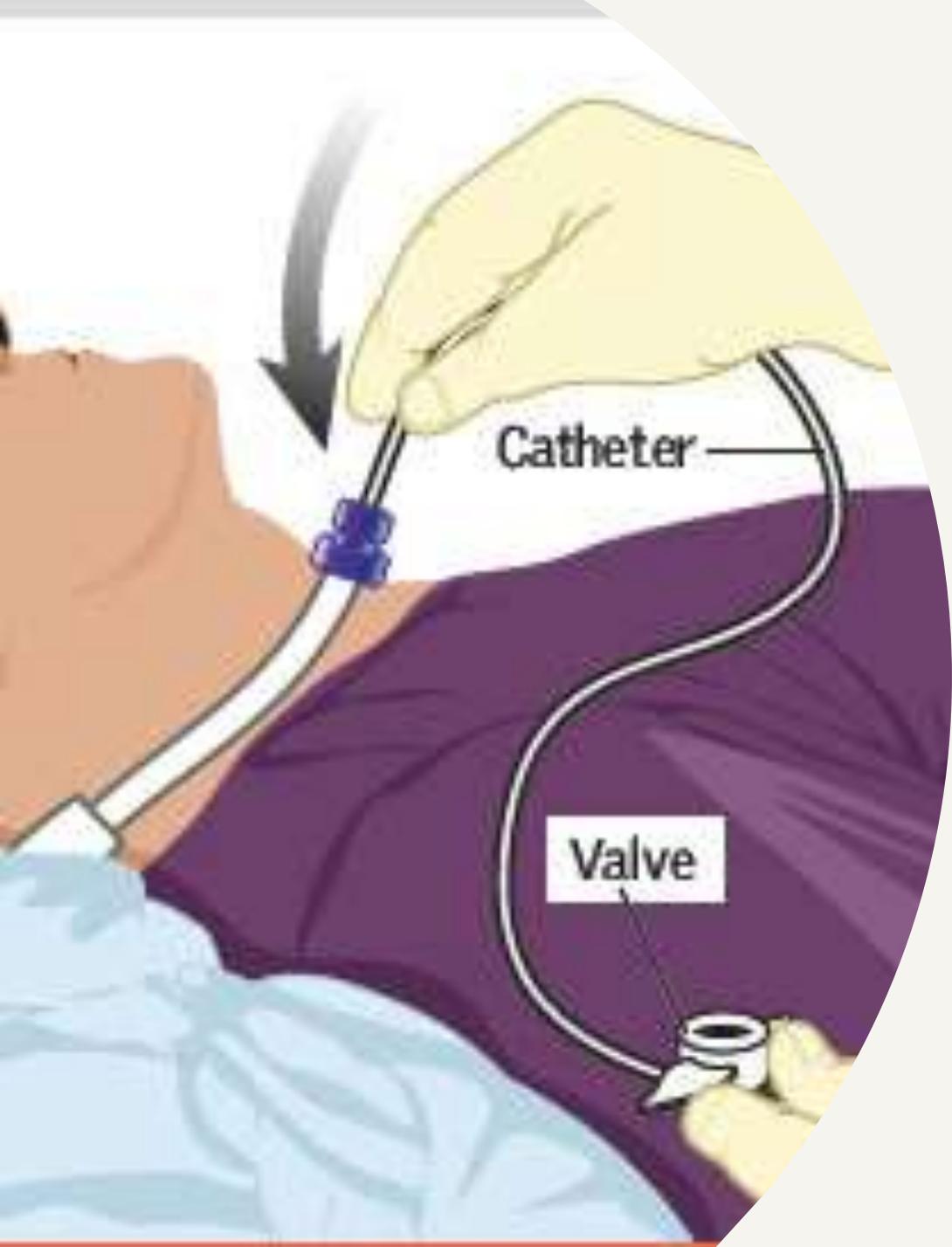
- Tracheal or subglottic stenosis
  - Granulation tissue
  - Tracheocutaneous fistula
  - Tracheo-esophageal fistula
  - Dislocation of tracheostomy tube
  - Bleeding from stoma or during suction
  - Blockage of tracheostomy tube
  - Laryngeal injury or alteration of phonation
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# *Tracheostomy tubes*

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- Plastic / metal
- Fenestrated / Non fenestrated
- Cuffed / uncuffed



# *Tracheostomy patient care*

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- Safety first
- Care of the stoma ( suction ) - using aseptic technique and dressing – 2 to 3 times per day – once removed the stoma will close over few days.
- Nutrition - can the patient eat?
- Infection control

# *Chest tube*

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*Intercostal drainage is the insertion of a tube into the pleural space to evacuate air/fluid, to help regain negative pressure and thus promote lung expansion.*



# *Indications*

- Pneumothorax ( primary – secondary – tension )
- Hemothorax
- Pleural effusion ( malignant – empyema )
- Chylothorax
- Post operative cardiothoracic surgery
- Mechanically ventilated patients with any size pneumothorax / hemothorax

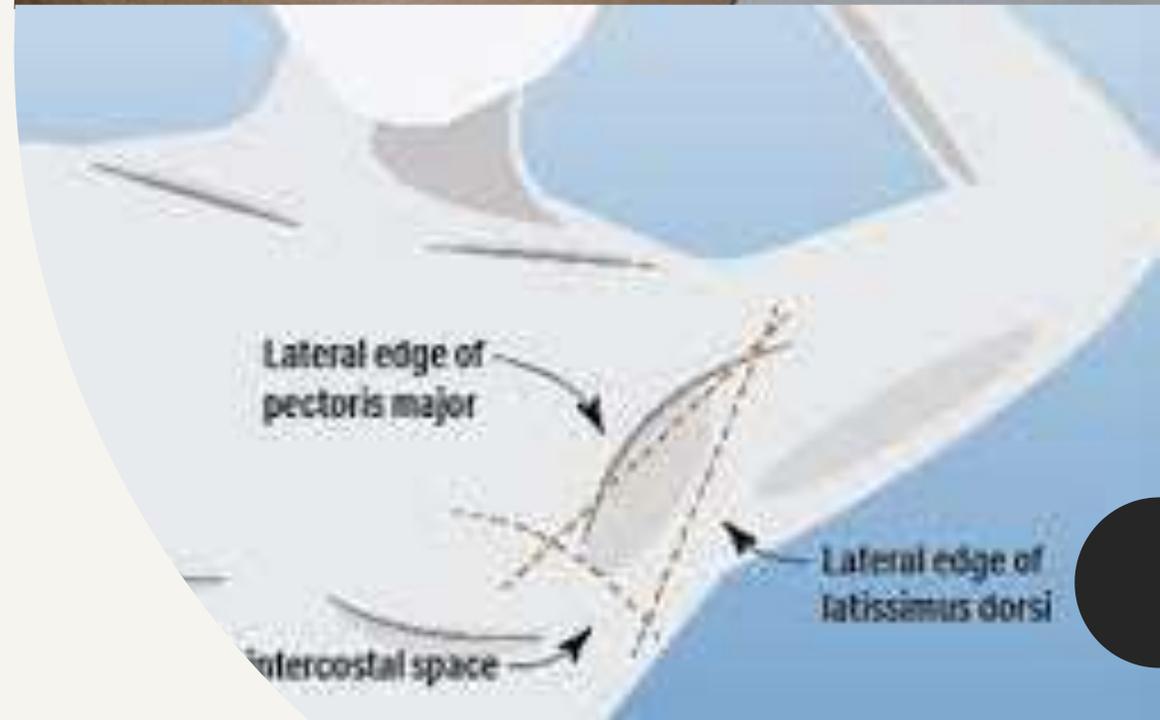
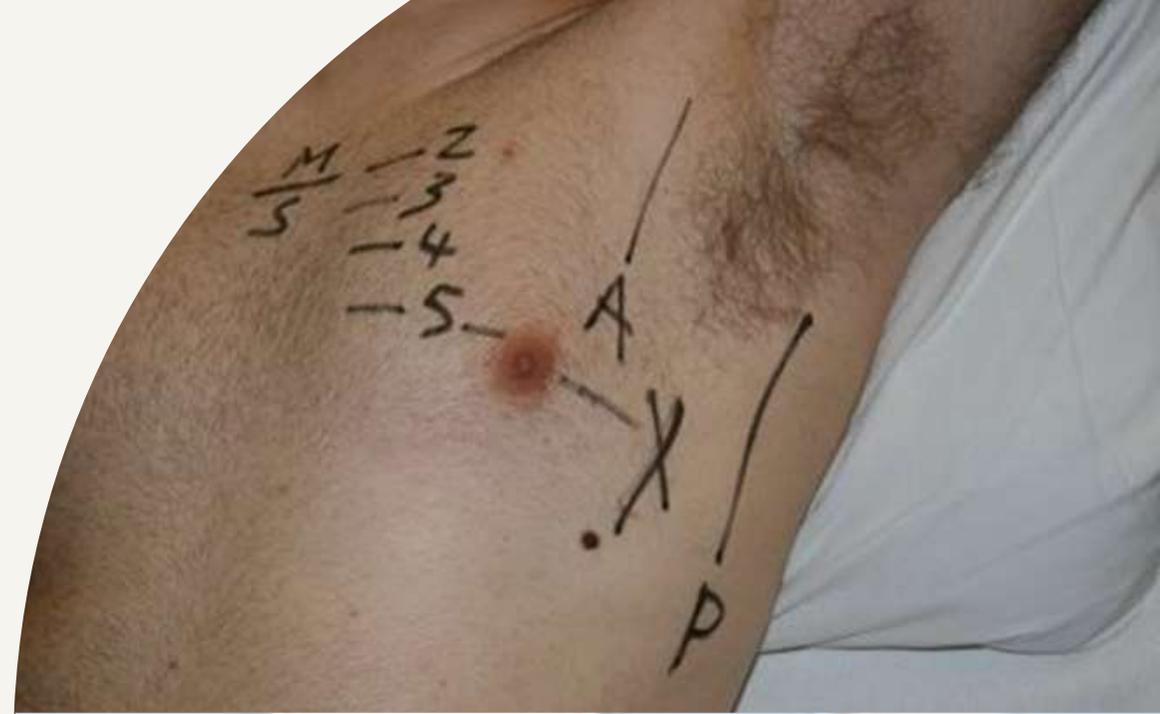
# *Contraindications*

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- *Lung adherent to the chest wall*
  - *Uncorrected coagulopathy*
  - *Skin infection*
  - *Loculated pleural effusion*
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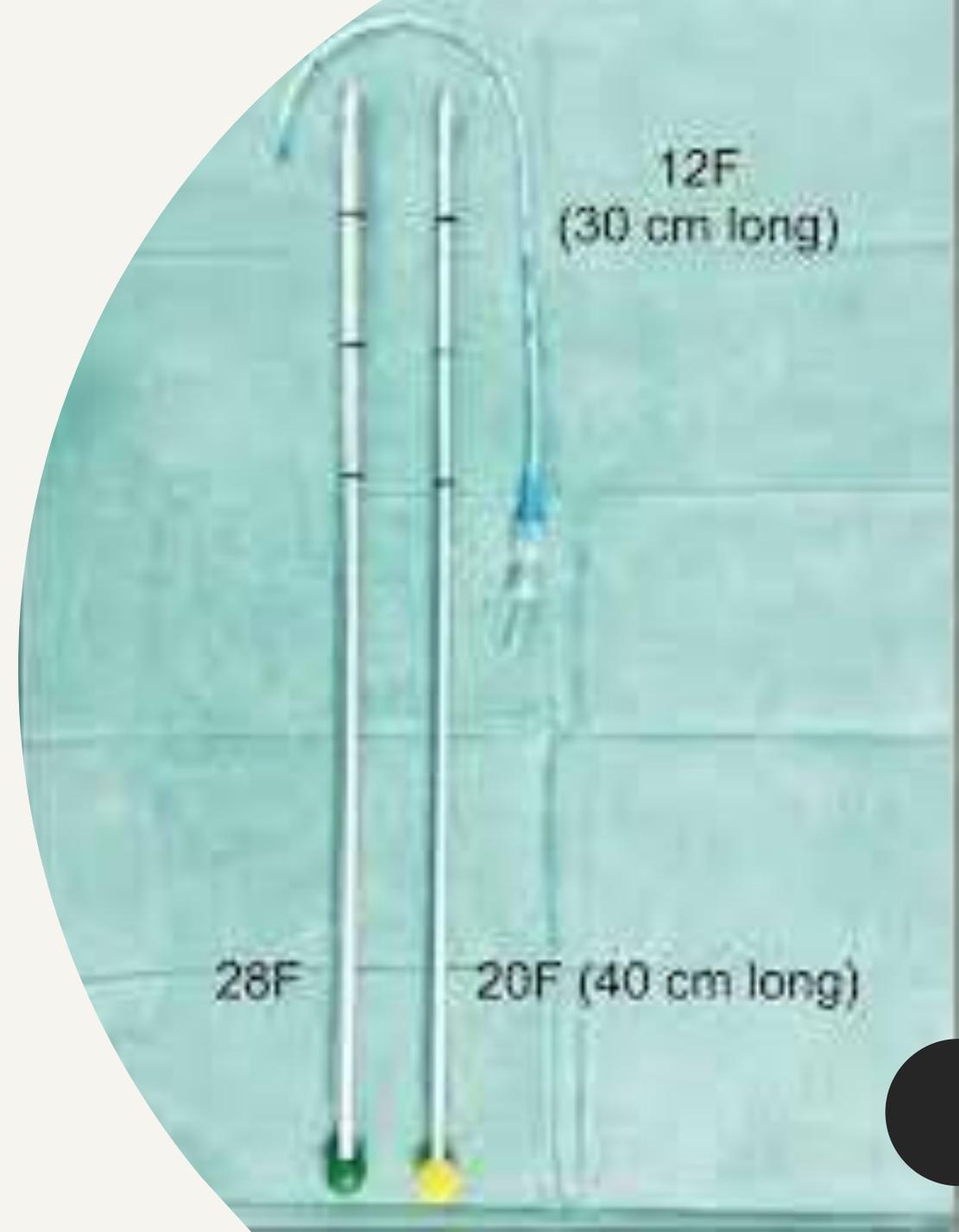
# Site of insertion

- Triangle of safety – boundaries ?
- 4th to 5th intercostal space, anterior to the mid axillary line
- Patient position ? ( supine – sitting/semi - lateral position, with ipsilateral arm behind her/his head )



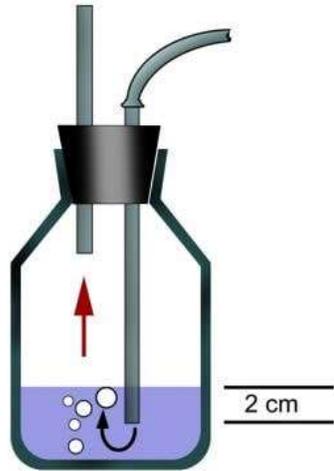
# *Size of tube*

- The unit of chest tube size is French sizing, which refers to circumference in millimeters
- Adult : 28-32 Fr
- Child : 18 Fr
- Newborn : 12-14 Fr

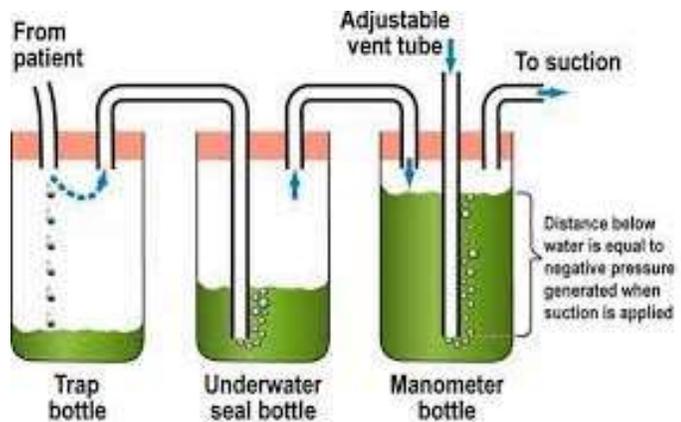


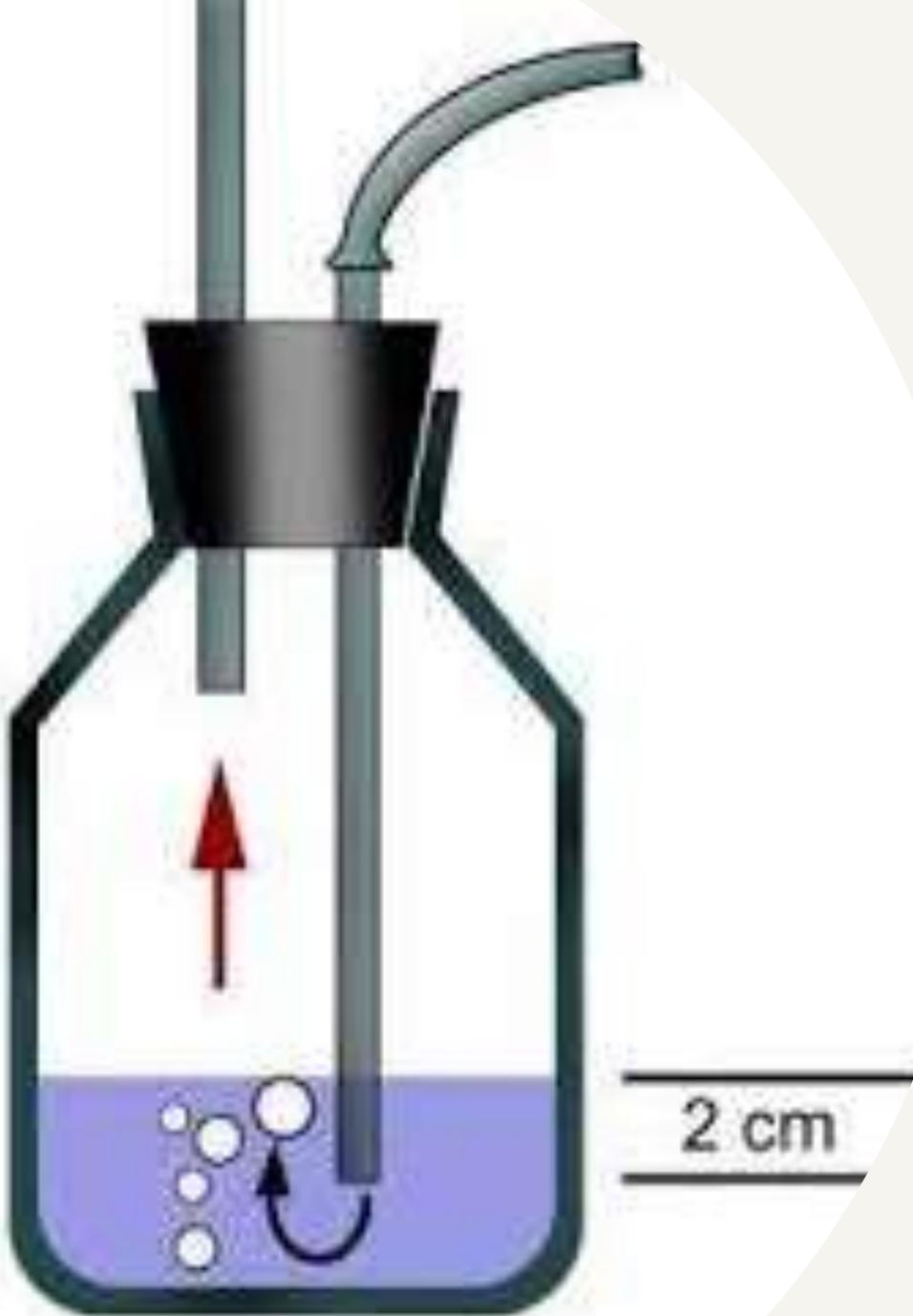
# *Chest tube bottle*

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- Underwater seal
- 3 chamber bottle ( collection chamber – water seal chamber – suction control chamber )



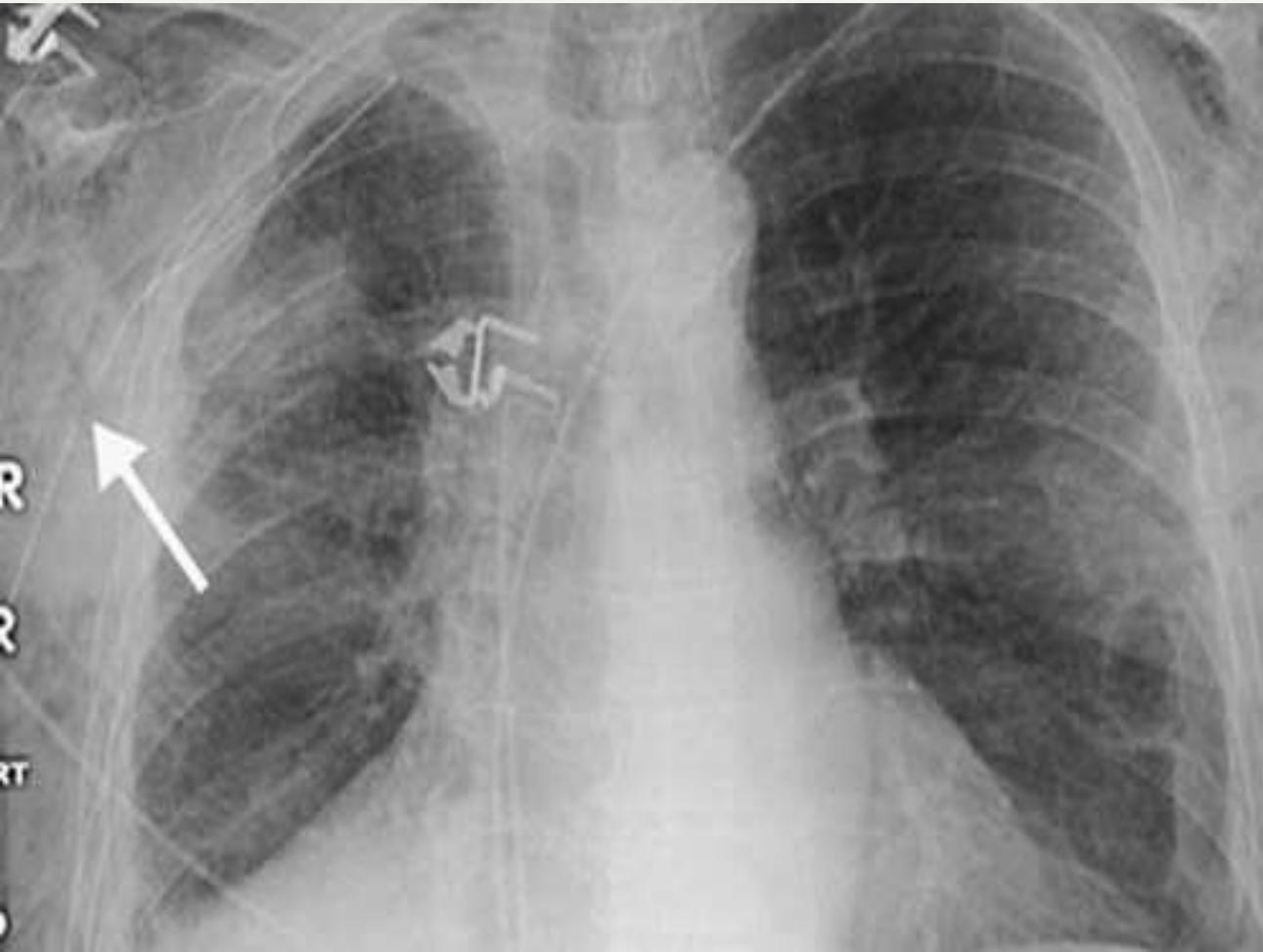


## *How to confirm that the chest tube is functioning?*

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- 1- physical examination : bilateral chest wall movement – air entry – improve saturation .
  - 2 – fogging of the tube
  - 3- bubbling
  - 4 – chest Xray

# Complications

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- Injury to the neurovascular bundle in the ICS
- Injury to lung parenchyma
- Injury to the diaphragm and consequent injury to intraperitoneal structures
- Injury to the heart and other great vessel
- Massive bleeding
- Empyema
- Skin excoriation and inflammation
- Subcutaneous emphysema and hematoma
- Obstruction
- Malposition
- Re-expansion pulmonary edema