

الطب والجراحة لجنة

Tracheostomy & Chest tube

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Pictures & Complications are Important in this lecture

Definition:

•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.(transient).



-used with ICU patients

Types of surgical airway:

- 1- Elective Tracheostomy (open/with surgery)
- 2- Cricothyroidotomy (Mini Tracheostomy); the speedy rapid one, used in ER and less complications
- 3- Percutaneous Dilatational Tracheostomy; by Endoscope

Indications:

1. Upper Airway Obstruction.
2. Pulmonary Ventilation. For more than 1 week
3. Pulmonary Toilet. Pt. can't cough
4. Elective Procedure.



1) Upper Airway Obstruction; anything causes Obst.

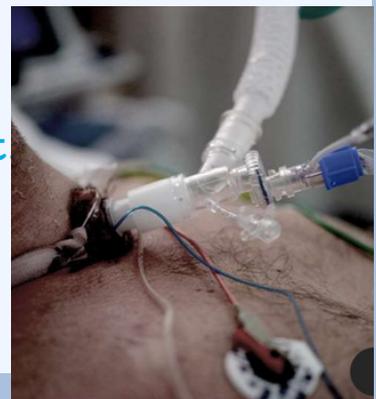
- Trauma
- Foreign body
- Infections
- Malignant lesions
- Vocal cord palsy.



This is macroglossia

2) Pulmonary Ventilation; with ICU pt. as Trauma pt

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



3) Pulmonary toilet

Those who cannot cough and clear their chest. **as paralytic patients**

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

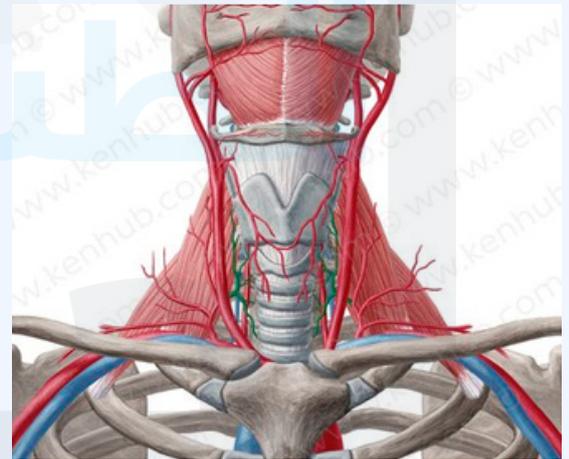
4) Elective procedures

- For major head and neck operations.

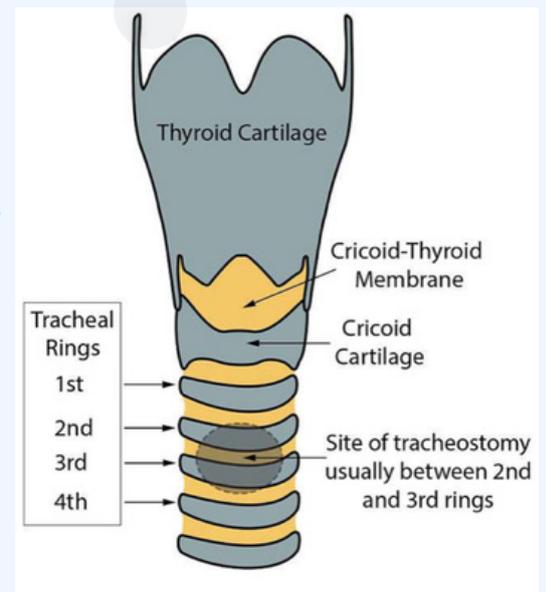


Anatomy

- 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**.



- Where do cricothyroidotomy insert?
Between Thyroid cartilage and Cricoid cartilage, in the cricoid-Thyroid membrane
- Where do tracheostomy insert?
Between 2nd & 3rd rings ; on X-ray appears in the middle
- What are the layers anterior the trachea?
skin, subcutaneous tissue and fascia, anterior jugular vein, pretacheal muscle, thyroid isthmus, pretracheal fascia, trachea



IMPORTANT

The Layers anterior the trachea:

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

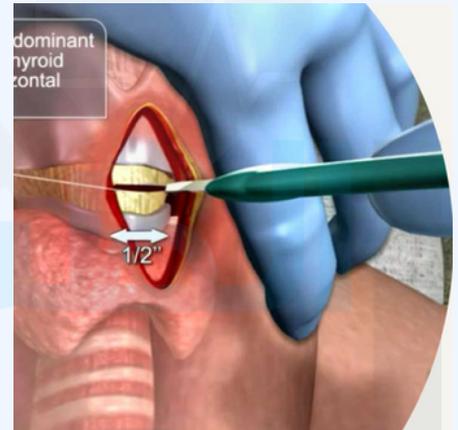


2nd type of surgical airway:

Cricothyroidotomy (mini tracheostomy);

Suitable for EMERGENCY

- Transverse incision over the cricothyroid membrane.

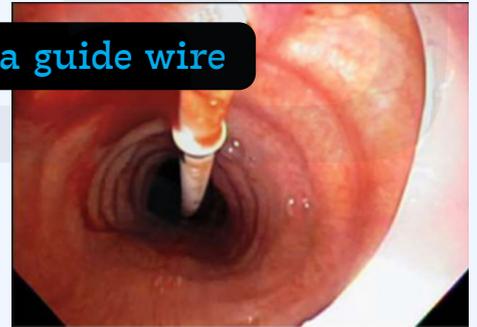


3rd type of surgical airway:

Percutaneous dilatational tracheostomy

- 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.**
- contraindicated in ER**

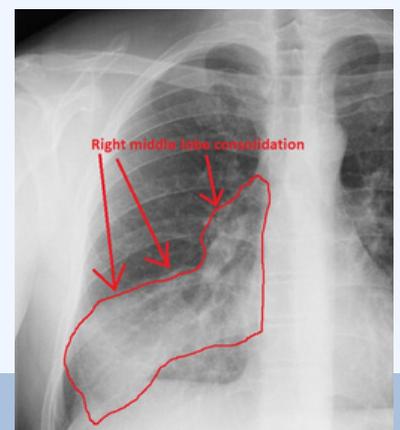
This is a guide wire



Complications of tracheostomy

Intraoperative complications:

- Loss of airway
- Bleeding and injury to big (major) vessels
- Injury to tracheoesophageal wall **mainly post. wall,**
tracheo-esophageal fistula



- Pneumothorax
- Aspiration

Post op.: Early complications / Late complications

Early complications:

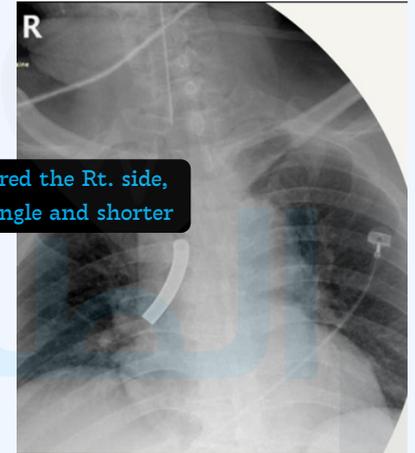
- Bleeding and local hematoma
- Tracheostomy tube obstruction and desaturation
- Tracheostomy tube displacement
- Infection
- **Surgical emphysema**

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



Tracheostomy tubes

- Plastic / metal
- Fenestrated (has hole) / Non fenestrated
- Cuffed (comes with balloon) / uncuffed

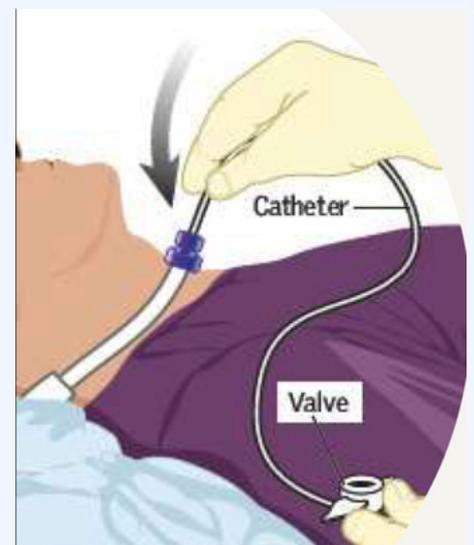


Non fenestrated

Fenestrated

Tracheostomy patient care

- 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

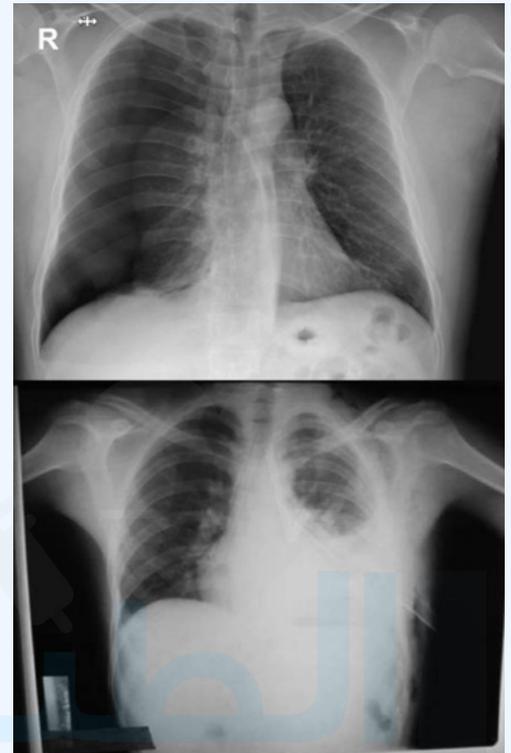


Chest tube

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:

- 1) Pneumothorax (primary - secondary - tension)
- 2) Hemothorax
- 3) Pleural effusion (malignant - empyema)
- 4) Chylothorax
- 5) Post operative cardiothoracic surgery
- 6) Mechanically ventilated patients **with any size pneumothorax / hemothorax keeps pumping air**

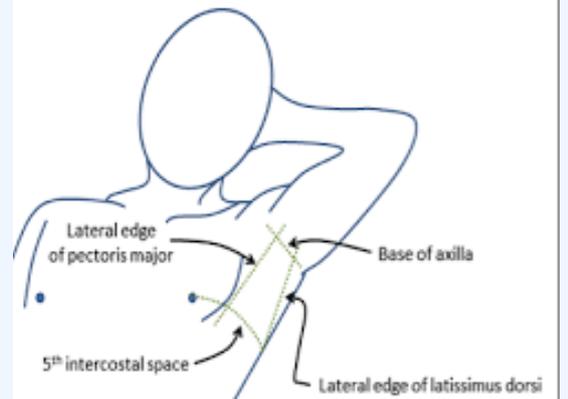
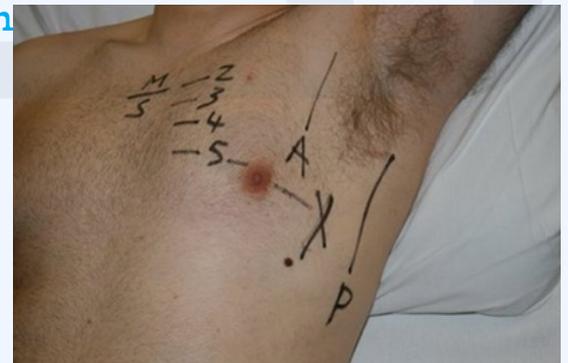


Contraindications

- Lung adherent to the chest wall
- Uncorrected coagulopathy
- Skin infection
- Loculated pleural effusion **multiple collection and separated from each others**

Site of insertion

- Triangle of safety - boundaries **on axilla ?**
Triangle of safety is the place where chest tube inserted, Anterior axillary line (pectoralis major) & Posterior axillary line (latissimus dorsi)
Inferior : the 5th intercostal space roughly the level of nipple in a thin male
- 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)
The most important thing is the Good view, so the pt. has to put his hand under his head

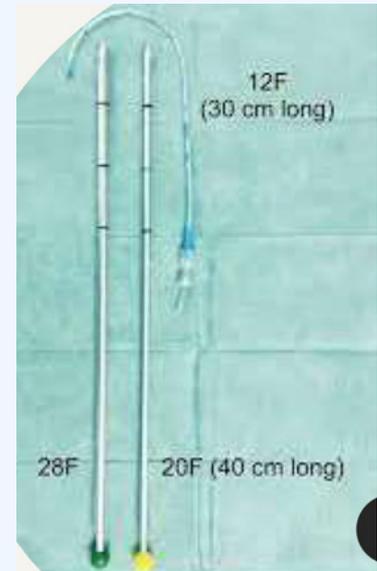


Size of tube

- 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

Fluid : Large diameter

Air : Small diameter

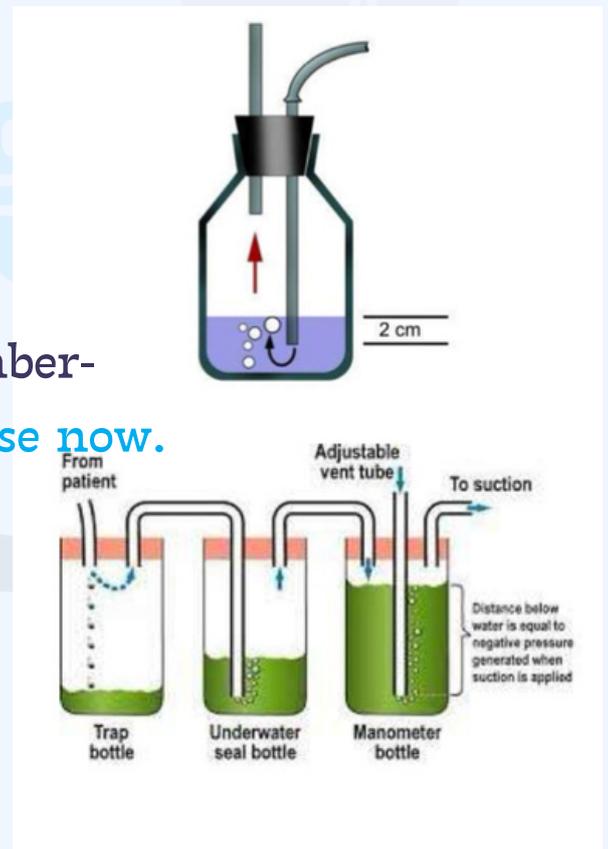


Chest tube bottle

- Underwater seal
- **3 chamber bottle**

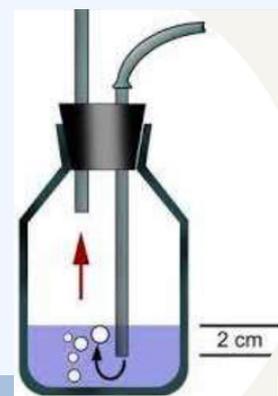
(collection chamber -water seal chamber- suction control chamber); rarely to use now.

The single chamber bottle used now



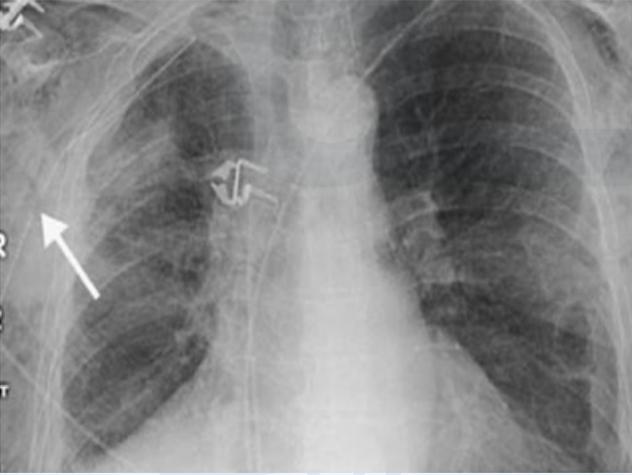
How to confirm that the chest tube is functioning?

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



Complications:

- 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



has real position,
Here, the chest tube causes surgical
empyema as the hole opened external
to the pleural space

إليك انتهت أمانينا يا صاحب العافية يا الله ❤️
! اذكرونا في دعواتكم يا رّوح