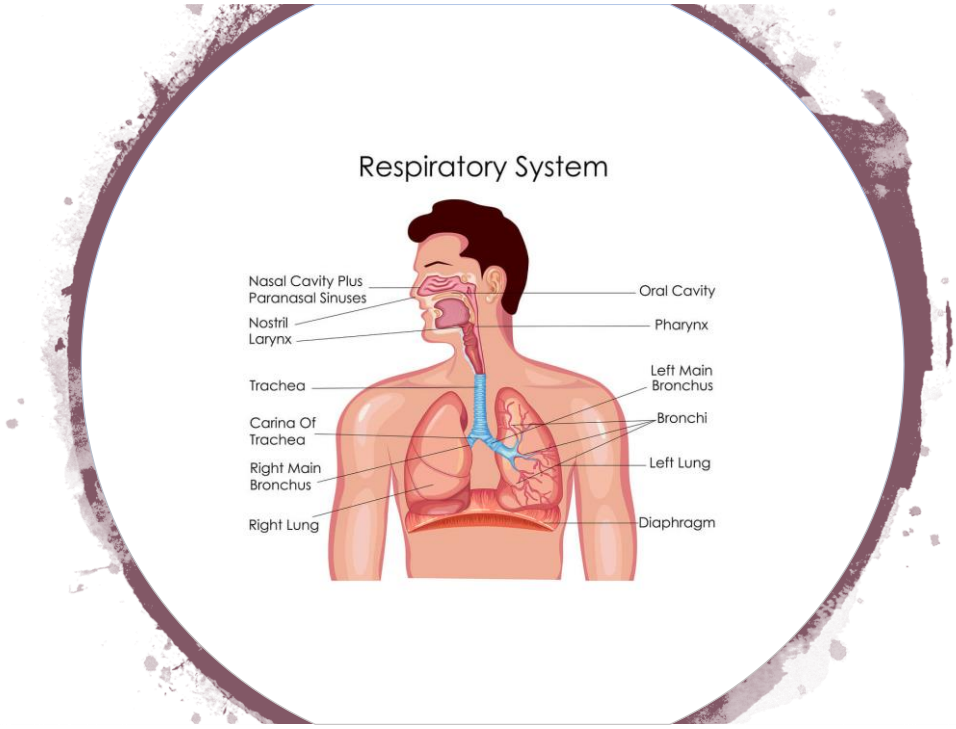
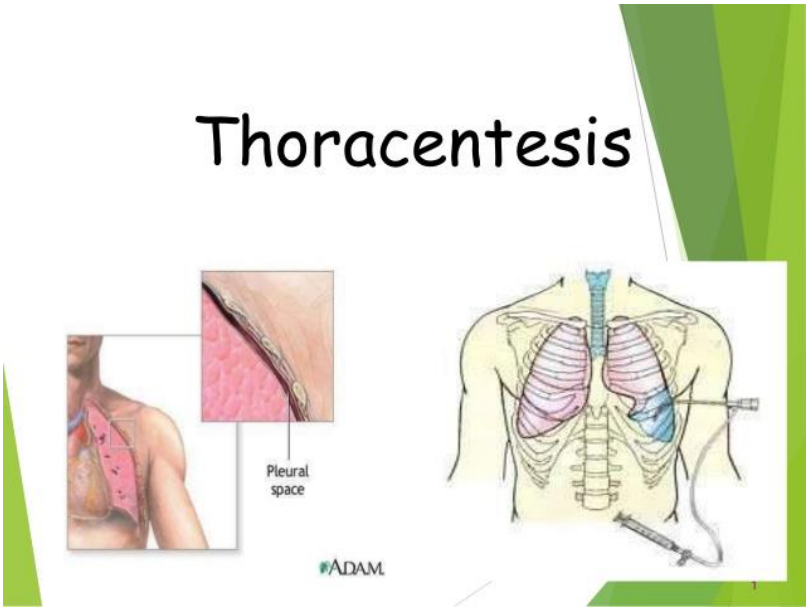
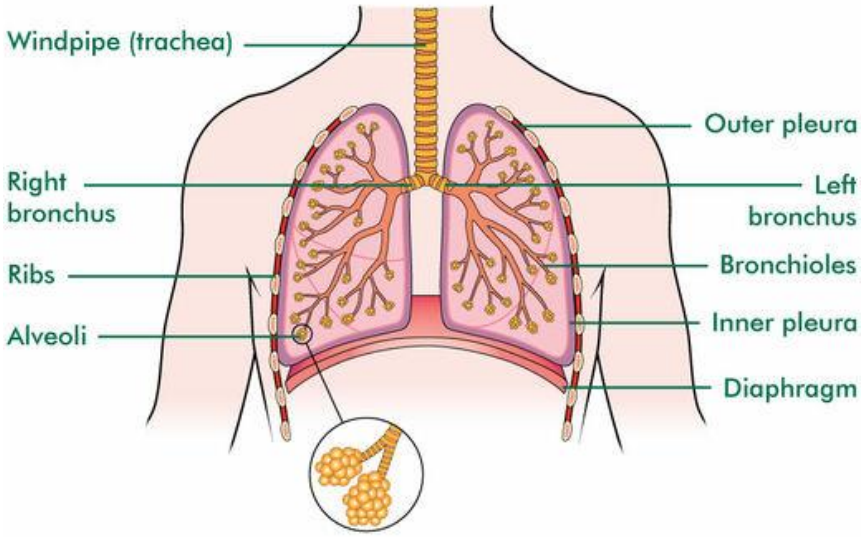

Respiratory System
Nasal Cavity Plus Paranasal Sinuses
Nostril
Larynx
Trachea
Carina Of Trachea
Right Main Bronchus
Right Lung
Oral Cavity
Pharynx
Left Main Bronchus
Bronchi
Left Lung
Diaphragm

1


Thoracentesis
Pleural space
ADAM.

2



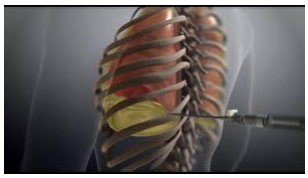
3

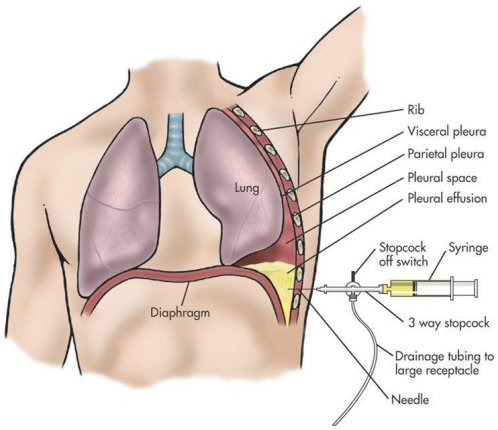
Thoracentesis

- Your client is informed that he will need a thoracentesis and ask you what is this.
- You explain that thoracentesis is a procedure in which a needle is inserted into ….

1.( ) the pulmonary parenchyma to remove samples of lung tissue.

2.( ) the pleural space between the lungs and the chest wall, to help diagnose and treat pleural effusions (*a condition in which the space between the lungs and the inside of the chest wall contains excess fluid*)





4

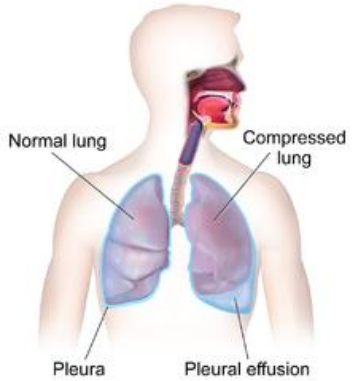
THORACENTESIS

- **For diagnosis:**
  - It is performed to help determine the cause of the accumulated fluid
- **For treatment:**
  - to ease any shortness of breath or pain by removing the fluid/blood/air, and relieving pressure on the lungs.
  - To drain air, blood or fluid from the pleural space or thoracic cavity.
  - to restore negative pressure in the pleural space resulting in re-expansion of the lung.

⇒ **Pre procedure:**

- Verify informed consent
- Check x-ray or ultrasound
- Assess and document baseline vital signs and breath sounds
- Prepare supplies
- instruct the patient (relieve anxiety) *(see next slide)
- Position the patient

Pleural Effusion

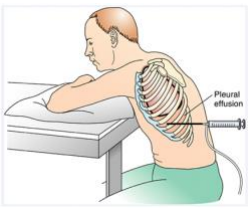


5

Thoracentesis pre procedure

lung collapsed - as the fluid is removed, the lung should reexpand

- Verify informed consent
- Check x-ray or ultrasound
- Instruct your patient, relieve anxiety:
  - stand still
  - no deep breezing
  - no coughing or sneezing
  - although local anesthesia prevents pain as the needle is inserted, a sensation of pressure may be felt. A pressure sensation occurs as the needle punctures the parietal pleura to enter the pleural space.
- Prepare supplies
- Position the patient (see next slide)



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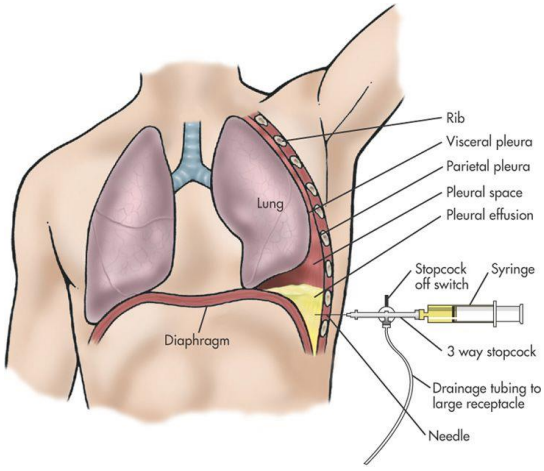
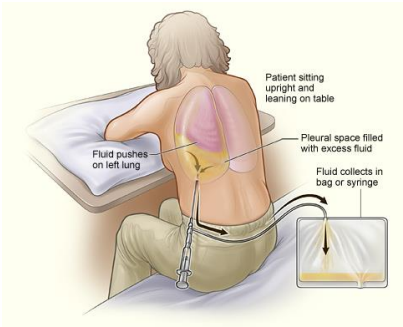
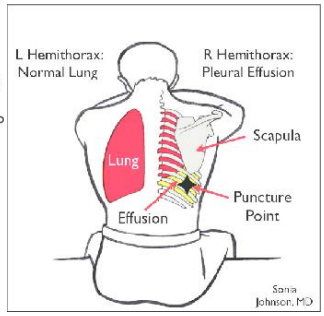
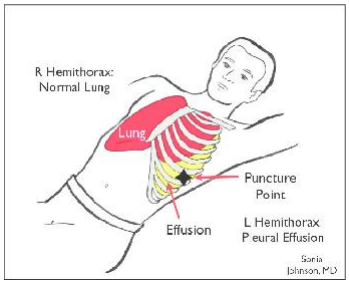








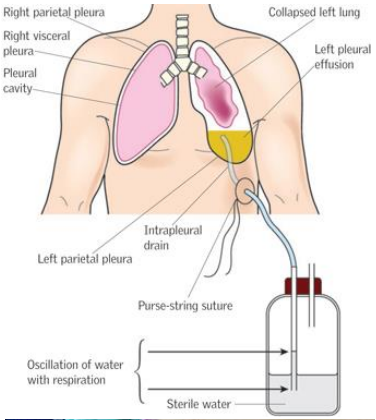
7

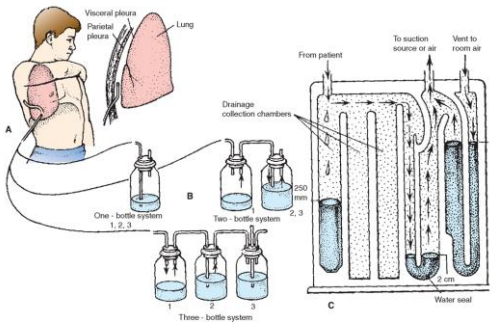
Pos procedure

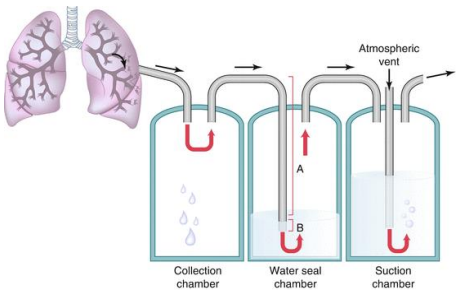
- Since fluid is removed

=> risk for fluid volume deficit

  - **Check vital signs**: BP and Pulse
- **Another x-ray**:
  - Is lung reexpanded?
  - No complication such as causing or worsening pneumothorax,?
- **Compress and cover puncture site**, or leave a **chest tube**







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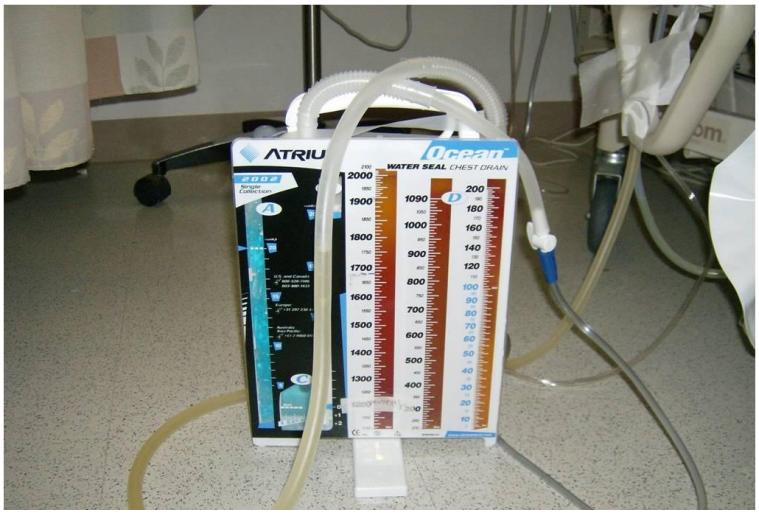
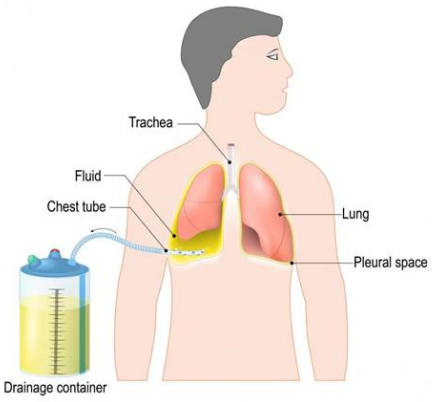


Chest Tubes

9

CHEST TUBES

- What is the purpose of the water seal?
  - To promote one-way flow out of the pleura' space
- Do you want to see fluctuation in the water seal?
  - Slight, with respiration => good connection
  - Daily X-ray => to check reexpansion
- When does the fluctuation stops? Causes:
  - Lung reexpanded
  - Kink or clot in the tube
  - Suction not working properly
- Bottle bellow the chest! to promote gravity drainage



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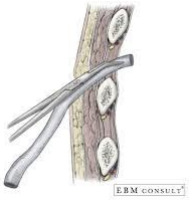


- **What would you do if the tube accidentally disconnect/dislodge when you are turning the patient?**

➢1) *Ideal*: you have a sterile connector on the bed side, in a package

➢2) *if not, do this*: reconnect the dislodged tube, and ask your patient to cough and deep breeze to reexpand the lung and get the air out (which could get in when the tube was disconnected)

- **What if the bottle brakes and the water pours out?**

➢1) *Ideal*: you have another sterile bottle on the bed side, in a package

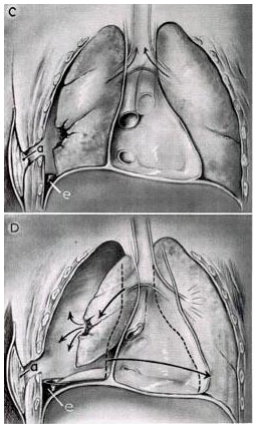
➢2) if you clamp the tube, do it only for a couple of seconds*(see next slide)

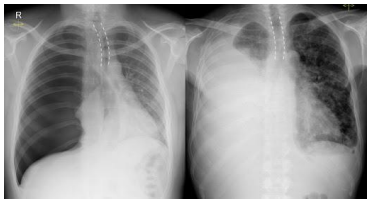
➢3) water on the side of the bed?

➢ anything you can to restore water seal

11

- Danger of ***clamping the tube*** a little longer: **tension pneumothorax → mediastinal shift → tracheal deviation**
  - **Tracheal deviation** is a medical emergency. Is a clinical sign that results from unequal intrathoracic pressure within the chest cavity.
  - The trachea is displaced in the direction of less pressure. *Meaning, that if one side of the chest cavity has an increase in pressure (such as in the case of a pneumothorax) the trachea will shift towards the opposing side.*

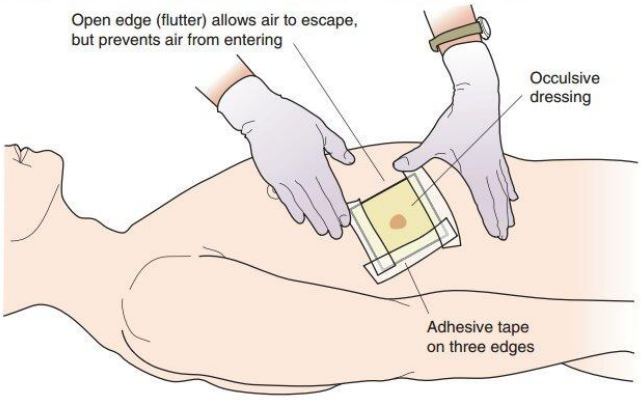




12

NCLEX Chest Tube Becomes Dislodged From Patient

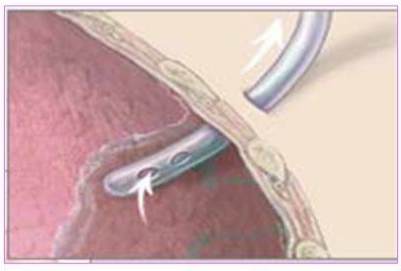
- Immediately cover chest tube insertion site with sterile occlusive dressing (petroleum gauze) reinforced with several 4×4 pads.
- Tape three sides of dressing, leaving one side open for air to escape.
- Notify RT/physician STAT.
- Stay with Pt and monitor for signs of respiratory distress.



13

If the chest tube is pulled and dislodged, the drainage holes can actually be "outside of the patient" sucking air. Air can dangerously accumulate.

In addition to the bubbles in the air leak chamber you should be able to hear this with a stethoscope.



What to do:

- Take dressing down wrap hole with Vaseline gauze
- Call for a stat CXR.

14

✓f the chest tube is connected to suction → **intermittent bubbling**

Chest tube stripping

Problems:

- If vigorous, continuous excessive bubbling: air leak in the system
- Call the doctor if:
  - Drainage exceeds 100cc per hour
  - Drainage becomes bright red
  - Sudden changes

- **Do not:**
  - Milk or Squeeze (can dislodge clot or traumatize lung tissue)
    - If there are visible clots in tubing, obtain a physician's order to gently "milk" chest tube. Starting at proximal end, gently squeeze and release chest tube between your fingers along length of tubing.
    - Never "strip" chest tube, which means squeezing length of tube without releasing it.
    - Milk chest tube only as directed by physician.
    - Neonatal patients with a chest tube may lay supine and must be on continuous oxygen saturation monitoring.

15

NURSING ALERT:

- Adult patients with a chest tube who are stable may be transported without being accompanied by a nurse.
  - Nurse must assess that patient is being transported safely. Transport by stretcher may be indicated.
  - Pediatric and neonatal patients with a chest tube must be accompanied by a nurse.
- Patients may have a physician's order that indicates they must stay on suction at all times. In this case, do not disconnect suction for tests without checking with physician.

16

NURSING ALERT:

- Signs of subcutaneous emphysema are:
  - swelling, crepitus of upper torso, arms or face.
  - Crackling around chest tube will be felt on palpation and heard on auscultation.
  - If these signs are present, notify physician.

17

NURSING ALERT:

- Clamp chest tube close to chest wall just prior to changing collection chamber.
- Clamping should not exceed one minute

18

NURSING ALERT:

- Signs and symptoms of tension pneumothorax are:
  - Shortness of breath
  - Diaphoresis
  - tracheal shift
  - hypotension and other signs of shock*.
- If these symptoms are present remove dressing and call physician immediately
  - *obstructive shock

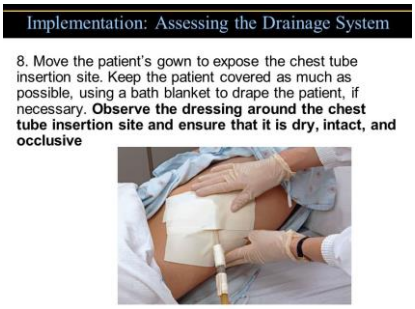
19

NURSING ALERT:

- Chest tubes are not removed by an RN. Only small bore pleural tubes may be removed by R.N.'s certified in that procedure.

20

- Dressing change around the insertion site of the chest tube:
  - Pull off one layer at a time (sterile dressing change)
  - If accidentally pulls out the tube:
    - do not reinsert it.
    - instruct the patient to perform the Valsalva maneuver.
    - Close with your hand, or pinch, call for help.
    - At end-expiration immediately cover the insertion site with vaseline gauze (if indicated by your hospital), a dry sterile dressing, and occlusive tape



- When removing chest tube
  - Patient: deep breath and Valsalva
    - Intra thoracic pressure ↑
    - Immediately put occlusive petroleum gauze

21

NURSING ALERT:

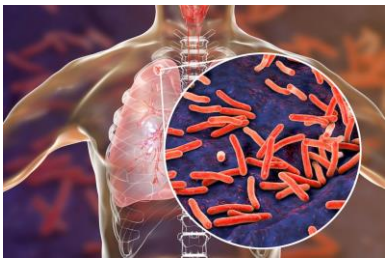
ACCIDENTAL REMOVAL

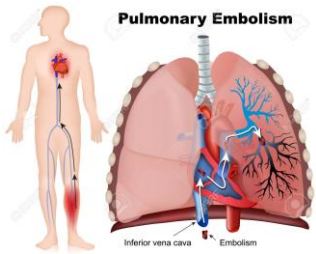
1. Apply gauze pad over exposed insertion site immediately and tape on three sides only.

2. Do not tape on all 4 sides. Air will not have an escape route therefore causing risk for tension pneumothorax.
3. Notify physician immediately.
4. Stay with patient.
5. Assess patient for signs and symptoms of tension pneumothorax.

22

LUNG CANCER, TUBERCULOSIS, PULMONARY EMBOLISM

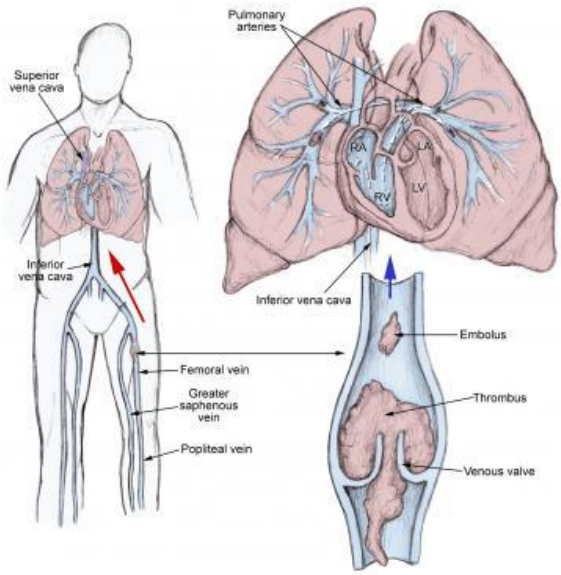




23

Pulmonary embolism

- Causes:
  - Venous stasis
  - Birth control pills
  - Dehydration
  - Others



24

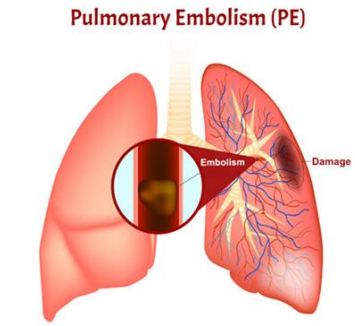
Pulmonary Embolism s/s

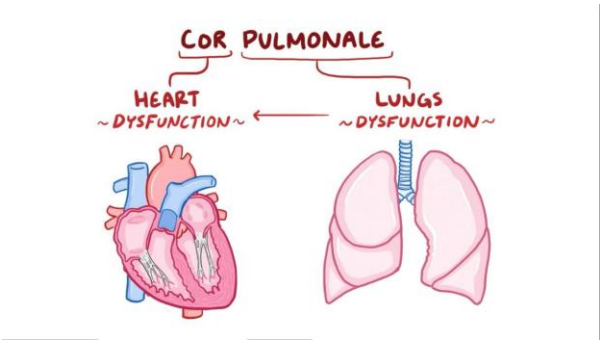
- ↑RR
- ↑HR
- ↑Chest pain (block clot)
- pO2 ↓
- Hypoxia

  => short of breath

  => Lung pressure ↑ (pulmonary hypertension)

  => heart workload ↑
- Leads to right side heart failure (cor pulmonale)
- White blood count ↑ (inflammation)





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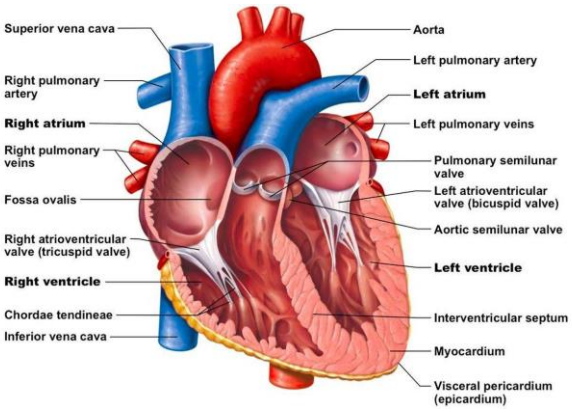


- **What is cor pulmonale? Select all that apply**

( ) Right sided heart failure caused by chronic pulmonary arterial hypertension

( ) Enlargement of the right due to high blood pressure in the arteries of the lung (pulmonary hypertension)

( ) Is when the heart quivers instead of pumping due to disorganized electrical activity in the ventricles

( ) It is a type of cardiac arrhythmia.

( ) Is the reduction of blood flow to the heart muscle due to build-up of plaque in the arteries of the heart.

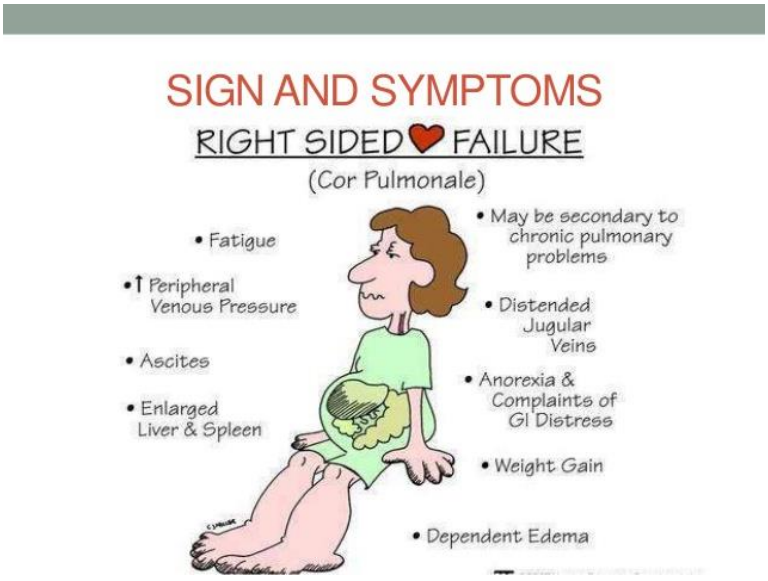
26

What are clinical features of cor pulmonate? Select all that apply

( ) ↓Blood pressure

( ) Jugular Vein Distension

( ) Bound Pulses



27

Tests – Pulmonary embolism

- CT
- LAB:
  - D-DIMER
    - Is the patient having hyperfibrinolysis.
  - PTT/ INR
    - Is the patient having high clotting rates?
    - Has the patient a reason to have a PE?
    - How is the patient's lifestyle? Smoke? Other risk factors?

28

RN management - Pulmonary Embolism

Prevent!

- Hydration
- Ambulation
- Compression device to help blood return from limbs when needed
- **Sequential Compression Device** (SCD) is a method of DVT prevention that improves blood flow in the legs
- **Lovenox** (**enoxaparin**) –anticoagulant

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RN management - Pulmonary Embolism

TREATMENT

- Oxygen
- Ventilator if needed
- Monitor the right ventricle for failure
  - sometimes is placed a Swan-Ganz catheter to monitor
- Check ABG
  - **Drugs**
- Anti coagulation therapy – IV Heparin (Sometimes, bolus IV heparin, continuous infusion)
- - why not Coumadin? (oral – 2 to 3 days to reach therapeutic range)
- - Heparin is used to **stabilize** the clot
- - when go home -> coumadin
- (don't stop Heparin suddenly. Taper it)

- as heparin is brought down , bring up coumadin

30

RN management - Pulmonary Embolism

TREATMENT

- **Drugs (cont.)**

- Clot buster (TPA)* - **Thrombolytic therapy**

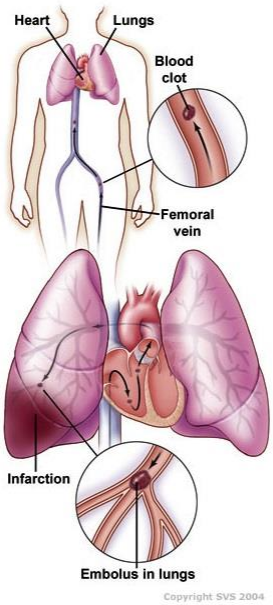
  - Risk for bleeding! Avoid clotting but also avoid bleeding!

TPA -Tissue plasminogen activator (abbreviated **tPA or PLAT)*

- *is a protein involved in the breakdown of blood clots.*
- *usually given through a vein in the arm with the first three hours (for stroke).*
- *This drug restores blood flow by dissolving the blood clot*

- Enoxaparin (Levonox), or warfarin – blood thinner (anti coag.)

- Analgesics

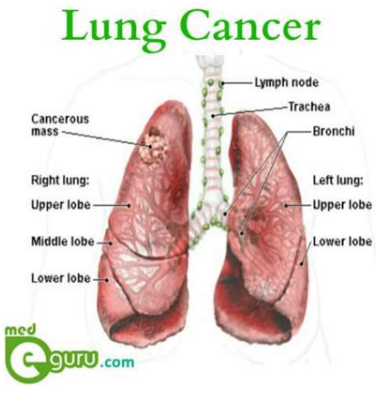


31

LUNG CANCER, TUBERCULOSIS

Lung cancer s/s

- voice hoarse
- cough
  - Blood sputum (Hemoptysis)
- Shortness of breath
- Weight loss
- Fatigue
- Effusion



TB s/s

- Cough
  - Blood tinged (spots)
  - Dry drainage
  - Purulent
- Anorexia
- Weight loss
- Night sweats

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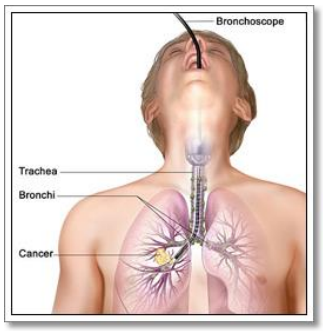
Tests

Lung cancer

- Sputum test (Spit culture)
- Chest x-ray/ CT (to locate tumors)
- Bronchoscopy - (NPO)*
- Biopsy

*Remember: Fasting is very important before a procedure with sedation.



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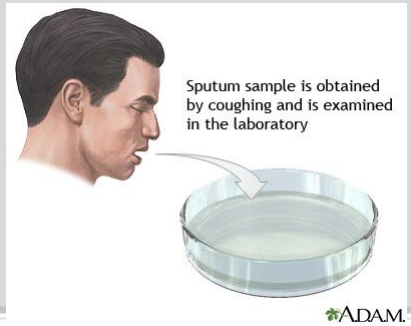
Tests

TB

- Sputum culture
  - Only 1 + (positive) to start treating TB
  - 3 - (negative) to be discharged to return into the community



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RN management

Lung cancer

no smoking

exposure to asbestos?

exposure to heavy metal?

Treatment -> chemo – radio - surgery

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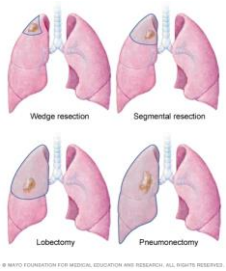

Tuberculosis

spread by droplet or air borne?

- patient in negative pressure room
- cough on a tissue, discard on proper bag, etc.

Treatment:

- 6 to 12 months
- 2 to 4 drugs* (very hard on the liver) - watch out for jaundice, for coagulation problems
- 2 to 3 weeks - wear mask

*(see table next slide)

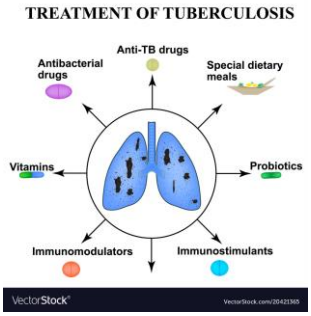

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Table 8.1: Common side effects of TB drugs

Side effects	Drug(s) responsible
Minor	
Anorexia, nausea, abdominal pains	Rifampicin
Joint pains	Pyrazinamide
Burning sensation in feet	Isoniazid
Orange/ red coloured urine	Rifampicin
Major	
Skin itching/ rash	Streptomycin, Rifampicin, Isonazid
Deafness (no wax on otoscopy)	Streptomycin
Dizziness (vertigo, nystagmus)	Streptomycin
Jaundice (other causes excluded)	Isoniazid, Rifampicin, Pyrazinamide
Vomiting, confusion	Isoniazid, Rifampicin, Pyrazinamide
Visual impairment/ loss	Ethambutol
Generalised purpura, shock and purpura	Rifampicin

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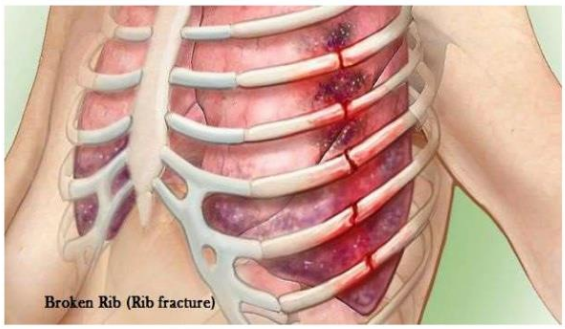
CHEST TRAUMA



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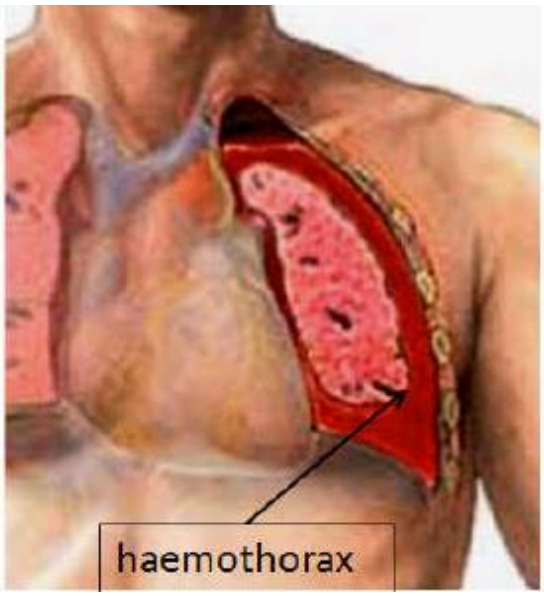
CHEST TRAUMA

GENERAL TREATMENT

- Chest tube
- Oxygenation/ Ventilation
- Chest x-rays
- Elevate head of the bed

HAEMOTHORAX

- S/S depend on the size:
  - Decreased breath sounds on the side
  - Respiratory distress
  - Pain
  - ↑Respiratory Rate
  - You feel subcutaneous air (subcutaneous emphysema)



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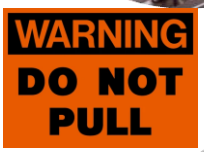
CHEST TRAUMA



NEVER pull out a penetrating object (seal)

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BLUNT TRAUMA

- ↑ Pressure inside the chest/plural space
- → collapses the lung,
- pushes to the opposite side
- → mediastinal shift

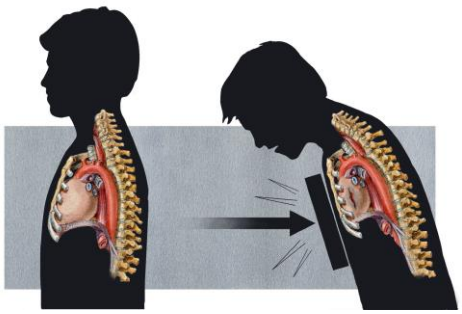
• S/S

- subcutaneous air
- absence of breast sounds in the affected side
- Asymmetry of the thorax
- Respiratory distress

- Can be fatal as accumulating pressure :
  - Compresses vessels
  - Decreases venous return
  - Decreases cardiac output

• Treatment

- Large needle in the 2nd intercostal space
- Chest tube lower in the chest



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Open chest trauma

- Ask Patient to inhale and exhale
  - Or Valsalva
  - Or take a deep breath and hold
- => Put petroleum gauze
    - => tape down 3 sizes
- Position: sit to expand the lungs (if patient can)
- Trauma patient in general keep on flat

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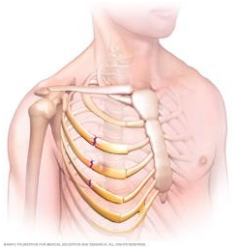
Fractures on sternum and ribs

S/S

- Tenderness
- Crepitus
- Shallow respiration
  - because of pain when breezing => lead to respiratory acidosis



TREATMENT

- Non narcotic analgesic
- Support the injury to limit movement
- Generally ventilator with PEEP (Positive End-Expiratory Pressure)
  - Not breezing on his/her own
  - Ventilator exerts pressure down into the lungs to keep the alveoli open => increases gas exchange and decreases work on breezing
  - Expands thorax and realigns the ribs

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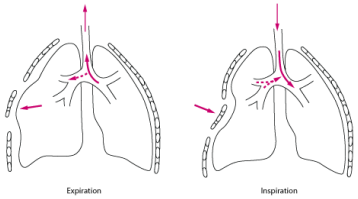
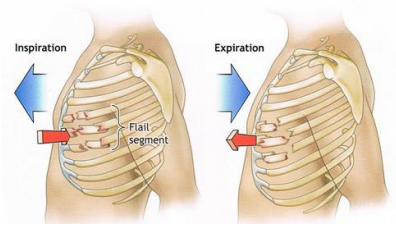
Anytime you see ventilators pressure supports

Priority Nursing Assessment

- Check bilateral breath sounds every hour
  - Because pushing pressure to the lung can blow out the lung cause pneumothorax



- Multiple real fractures – flail chest
- *life-threatening medical condition*
  - Pain
  - Paradoxical chest wall movements – seesaw chest (not simetrical)
  - Cianosis
  - ↑ Pulse
  - TREATMENT:
    - Stabilize the area
    - Intubate
    - Ventilate - Positive Pressure Ventilation (stabilize the area)



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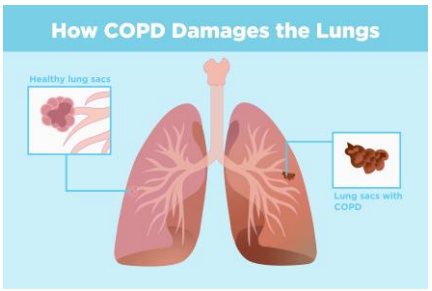
COPD

- IMPORTANT POINTS:
  - Don't give too much O2 – WHY? …….
  - If they stop breezing, would you give 100% O2 or 2 litters? WHY? …..



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