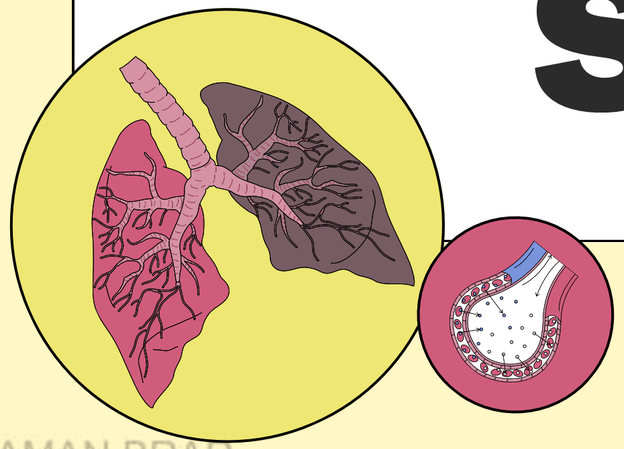
DAMAN BRAR

NCLEX RESPIRATORY SYSTEM



CONTACT US : +1206-554-9147

ABNORMAL LUNG SOUNDS

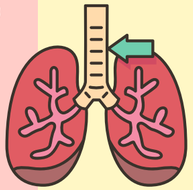
(Medical emergency - Airway obstruction)

STRIDOR

CONDITIONS -Epiglottis , choking , croup & After thyroid surgery

SOUND - High-pitched harsh inspiratory whistle Sound

LOCATION - Throat region (during) Blockage in the larynx (voice box) or trachea (wind pipe)



TREATMENT - Endotracheal intubation, Surgery

WHEEZES (Whistle)

CONDITIONS - Asthma attack , COPD

SOUND - High pitched musical flute sound heard during exhalation

LOCATION - Entire lung (narrow airways bronchoconstriction) or inflammation of lung

TREATMENT - Asthma attack

AIM - Albuterol , Ipratropium bromide, Methylprednisolone

CRACLES

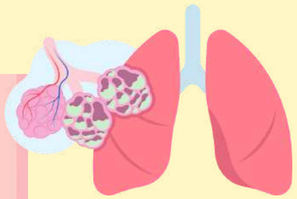
CONDITIONS - pneumonia , CHF with pulmonary edema

SOUND - Liquidy bubbling or crackling

Fine crackles = High Pitched (rubbing hair between fingers)

Coarse crackles = Low Pitched

LOCATION - Inflammation & congestion in alveoli



TREATMENT -

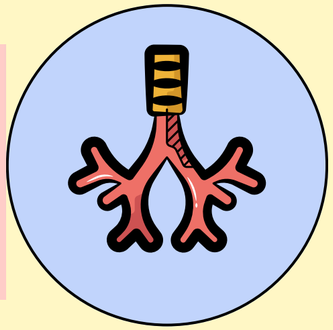
Antibiotics (infection) , Diuretics (furosamide)

RHONCHI

CONDITIONS - Copd , Pneumonia , Cystic fibrosis(Full of mucus) Bronchitis

SOUND - Low pitched or rumbling (like snoring)

LOCATION - Bronchi (not alveoli) such as mucus secretion and obstruction



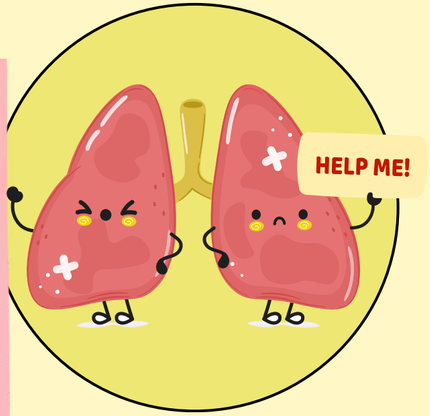
TREATMENT - Fluids to thin the secretions , chest percussion

PLEURAL FRICTION RUB

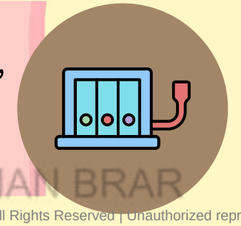
CONDITIONS - Worsening pneumonia

SOUND- Low pitched - Dry rubbing (like 2 rocks grinding)

LOCATION - Front side of lung (during inhalation & exhalation) - Inflammation & infection in pleural layer of lungs



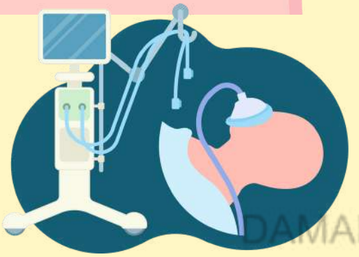
TREATMENT - TCBD (Turn, cough, breathing deeply), incentive spirometer , antibiotics

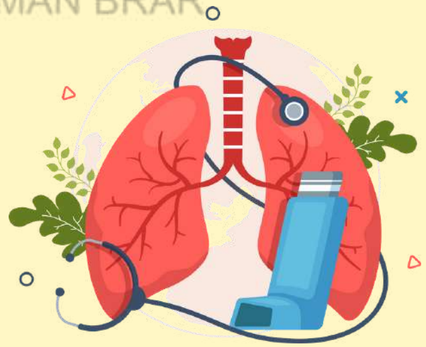


CHEYNE STOKE BREATHING

Abnormal pattern of breathing
Increase & Decrease in respiration rate seen in start & stop of breathing

TREATMENT - Mechanical ventilation & Intubation





ASTHMA

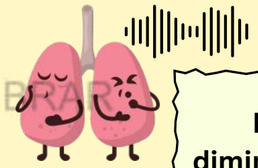
A chronic inflammatory disorder in the major pathways of the lungs: Bronchi & Bronchioles. Asthma comes & goes with flare-ups in the form of asthma attacks & these ARE REVERSIBLE!

QUICK TIPS

"Acute Attacks that come & go"

SIGNS

Tight CHEST & Tachypnea

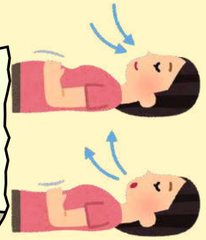


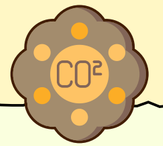
Minimum diminished breath sounds

QUICK TIPS

Hypercapnic respiratory failure = HIGH CO2
Hyper Capnic = High Carbon dioxide

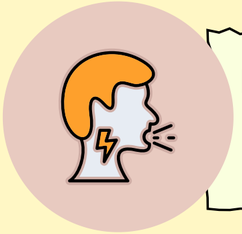
A - Accessory muscle use Critical Sign: Paradoxical Breathing



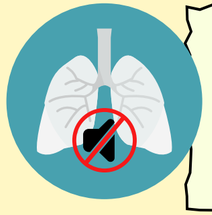


Acidosis - CO2 retention
Air trapping - Prolonged exhalation

S - SOB & dyspnea
Critical Sign: Single word dyspnea



High-pitched wheezing

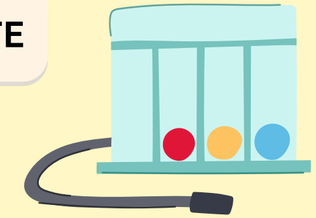


A - Absent breath sounds (silent chest priority)

TEACHING

we want to anticipate a severe asthma attack - before it happens!

PEAK EXPIRATORY FLOW RATE



GREEN ZONE

- Green means go.
- Asthma is around 80 - 100% under control

YELLOW ZONE

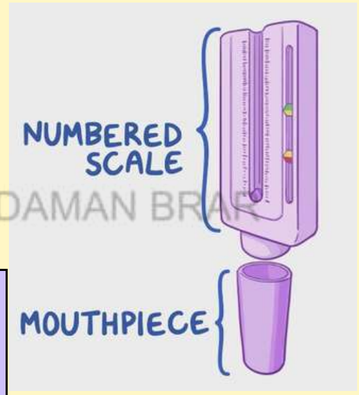
- Asthma is NOT under control here! So there is a HUGE need for additional medication

1. Rescue drug every 4 hours for 1-2 days
2. Call HCP (provider)

NEED additional meds or change in treatment

RED ZONE

- Red means Really bad
- Emergency treatment is needed immediately if the level does not return to yellow RIGHT after taking rescue drugs!



CORRECT ORDER - PEAK FLOW METER

1. Stand or sit in upright position
2. Put the flow meter scale to 0 or lowest value
3. Inhale deeply
4. Put the mouthpiece in mouth & create a seal with the lips
5. Exhale as quickly & forcibly as possible & record reading
6. Repeat 2 more times, with a break of 5 -10 seconds between
7. Record 1 score = the HIGHEST of the 3 attempts

DIAGNOSTICS

- PFT - pulmonary function test (not usually tested)

What are the triggers for asthma attack ?

- **S - Sickness (Influenza, URI)**
- **S - Severe weather (cold)**
- **S - Strenuous activity - NO need to avoid (Take meds before the exercise)**

AVOID DRUGS IN ASTHMA

DID YOU KNOW?

- N - NSAIDS Naproxen, Aspirin, ibuprofen, indomethacin, & ketorolac
- **N - Not good for Asthma**

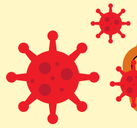
- **B - Beta blockers**
- **B - Blocked HR & lungs**
- Propranolol (Inderal) = Non-selective
- Atenolol = Selective (cardio “Beta 1” selective

ASTHMA TRIGGERS

Severe weather cold

Allergens (dander, dust, pollen)

Elevated Eosinophils



sickness

S - Stress (emotional, physical)

S - Smoking (second hand cigarette smoke)

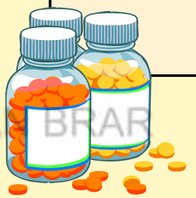
1ST SIGN OF HYPOXIA

MENTAL STATUS CHANGE

1. Agitation 2. Restlessness 3. Drowsiness

BRONCHODILATOR

- **B - Beta 2 agonist** - **albuterol** - think buterols for brutal asthma attacks! It's considered the 1 & only rescue drug for asthma attacks
- **A - Anticholinergics - Ipratropium** - dries out the body, decreasing secretions & dilating the airways - you cant pee - with a tro-pium
- **M - Methylxanthines** - **Theophylline** - very toxic & very fast HR!
  10 - 20 therapeutic range



ANTI-INFLAMMATORY

L - Leukotriene inhibitors ending in Lukast like Montelukast

M - Mast cell stabilizers - Cromolyn

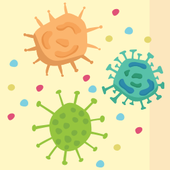
Q&A

what is aminophylline
- Aminophylline is a bronchodilator

AIM FOR ACUTE ASTHMA ATTACK
A - ALBUTEROL 1ST
I - Ipratropium 2nd
M- Methyl-prednisolone

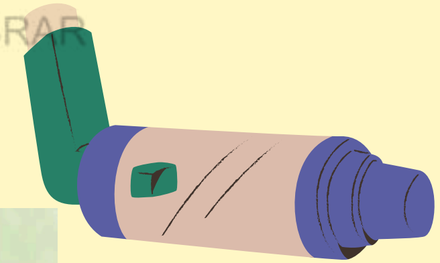
CORSTICOSTEROIDS

- **S - Steroids "-sone" like Beclomethasone** -
  Top side effects - 3 Ss for Sone Steroids
- **S - Sores in mouth** (oral thrush "candida") so instruct the client to wash out their mouth after every use & inhalers go into the sink, twicer per week.



- **S - Sepsis & sickness** (increased risk for infection) & increases WBC count in the body
- **S - Sugars** increased (elevated glucose levels)

METERED DOSE INHALER



MONITOR VITAL SIGNS BEFORE AND AFTER USE

- REMOVE CAP AND HOLD INHALER UPRIGHT: GRASPING IT WITH THUMB AND FIRST TWO FINGERS.
- SHAKE WELL BEFORE THE USE TILT HEAD BACK SLIGHTLY AND BREATHE OUT
- HOLD INHALER 1-2 CM AWAY FROM MOUTH
- PLACE INHALER MOUTH PIECE OR SPACER IN MOUTH

PRESS DOWN INHALER TO RELEASE MEDICATION (ONE PUFF)WHILE INHALING SLOWLY (BREATHE IN 2-3 SEC)

- HOLD BREATH FOR 10 SEC

EXHALE COMPLETELY

- IF NECESSARY REPEAT THE PROCEDURE

AFTER 2-5 MINTS

Q A

Which medication would you give?
Select all that apply
1. Inhaled salmeterol
✓ 2. Albuterol inhaler
✓ 3. Nebulizer Ipratropium
4. IV methamphetamines
✓ 5. IV Methylprednisolone

QUICK TIPS

MDI

IF USING TWO DIFFERENT MEDS
THEN GAP 5-10 MINTS
imp. GIVE
BRONCHODILATORS FIRST THEN STEROID
MOUTH RINSE AFTER STEROID TO REDUCE INFECTION CHANCES
EXPECTORATION OF SPUTUM AND KEEP TISSUE HANDY.

QUICK TIPS

PATIENT WITH SEVERE ASTHMA:

- Tachycardia (>120 BPM)
- Tachypnea (> 30 BPM)
- O2 sat < 90% on RA
- Peak exp. Flow < 40% predicted or best < 150L/min

CHRONIC OBSTRUCTIVE PULMONARY DISEASE

PATHOPHYSIOLOGY

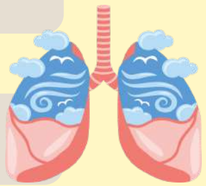
C Chronic destruction of the lungs

↓

O resulting in decreased gas exchange

↓

P leading to chronic air trapping



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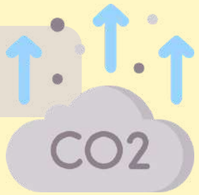
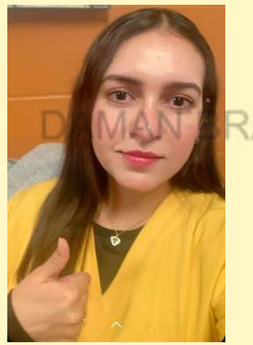
D high CO2 in the body





CAUSES & RISK FACTORS

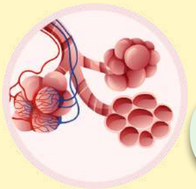
- Smoking
- Car mechanics

Risk factor for COPD ? client has smoked for more than 30 years

Low O2 saturation for COPD clients is expected

88-93% NORMAL

SIGNS & SYMPTOMS

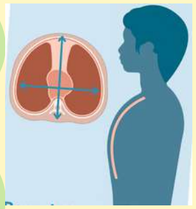


EMPHYSEMA

Damage to the Alveoli results in loss of lung elasticity & loss of inflation of lung tissue, resulting in loss of lung tissue recoil & air trapping.

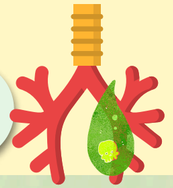
- Pink skin & Pursed-Lip breathing

- Increased chest “Barrel Chest”



- No chronic cough (minimal)
- Keep Tripoding

CHRONIC BRONCHITIS



Inflammation of the bronchi & excessive mucus production resulting in a chronic hacking cough, & recurrent infections.

- Cyanosis (big & blue skin)

- Long term “chronic” COUGH & Sputum

- Unusual lung sounds: Crackles & Wheezes
- Edema peripherally (due to cor pulmonale)

Anemia is NOT common with these patients, rather increased blood count.

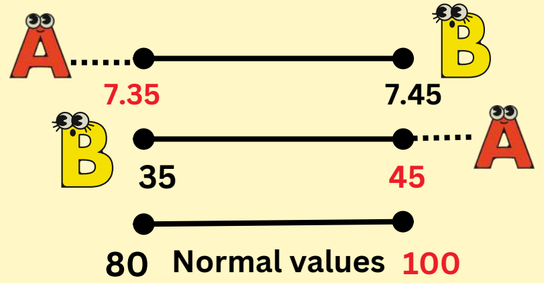
LAB VALUES

ARTERIAL BLOOD GAS

pH

$PaCO_2$

PaO_2



COPD

DEADLY COMPLICATION

Respiratory Failure:

HYPOXEMIC RESPIRATORY FAILURE = LOW O2

HYPERCAPNIC RESPIRATORY FAILURE = HIGH CO2

PRIORITY = BIPAP

QUICK TIPS

Low PaO2 32 = Hypoxemia

Below 80 (Normal 80 - 100)

High PaCO2 = HyperCapnic

pH less than 7.35 = Acidosis

PaCO2 - Over 45 = Acidosis

HYPERCAP - GIVE BIPAP

#1 MONITOR: MENTAL STATUS CHANGE

- Restless
- Decreased LOC
- Confusion

NCLEX TIP

Q&A

Partial pressure of carbon dioxide (PaCO2) is 65 mm Hg

This pt. with bronchitis is experiencing hypercapnia

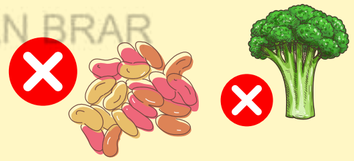
HIGH CO2 = HYPERCAPNIA

An elderly client with worsening COPD presents to the emergency department with fatigue and altered level of consciousness. Upon assessment the nurse finds O2 saturation of 87%, and ABG: pH 7.21, PaCO2 75, and PaO2 55 mm Hg. Which immediate intervention is best?

1. **Apply oxygen 4 LPM via nasal cannula.**
2. **Call respiratory for STAT albuterol treatment.**
3. **Sit the patient and apply bilevel positive airway pressure**
4. **Start looking for other jobs in cosmetic surgery**

DIET:

- Oral hygiene BEFORE meals to wake up the taste buds!
- Eat small, frequent meals (decreases stomach distention)
- **HIGH** calories & protein
- **AVOID** eating high amounts of carbohydrates
- **AVOID** exercise 1 hour Before/After meals - conserve oxygen for chewing & swallowing
- **AVOID Gassy Foods** like NO carbonated drinks
- **NO high-fiber** foods (broccoli, beans)



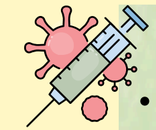
FLUIDS :

- Increase fluid intake 8 glasses (2 - 3L/day) to thin that mucous
- AVOID drinking fluids while eating

INFECTION

- Report increase in sputum
- Fever, Worsening dyspnea

Meds: Albuterol if short of breath to vasodilate the lungs & allow more air flow



VACCINES

- Pneumococcal every 5 years
- Flu vaccine every year

IMP NOTE - For our patients with heavy mucus

BRONCHITIS

Before Bed - Mobilize Secretions

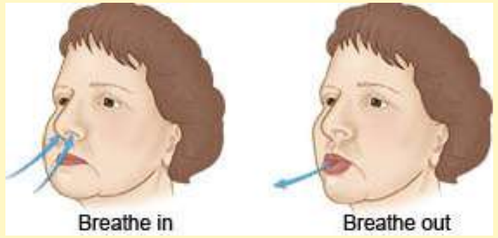
- Guaifenesin (Brand: Mucinex)
- Cool mist humidifier at night to make breathing easier.

BREATHING

Pursed lip breathing

- Inhale: 2 seconds via nose (closed mouth)
- Exhale: 4 seconds with pursed lips

- 2 nostrils = 2 seconds INhale like smelling a rose -
Pursed lips for 4 seconds EXhale like blowing a Candle



NOSE IN

MOUTH OUT

COPD EXACERBATION

NO OPIOIDS:

- M**O**rphine
- Hydr**O**morphone
- HydrOcodone
- Oxyc**O**done

NO ‘O’

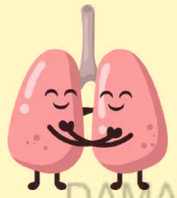
NO BENZOS:

- Diaze**pam** (brand: Valium)
- Loraze**pam** (brand: Ativan)

NO LAM & PAM

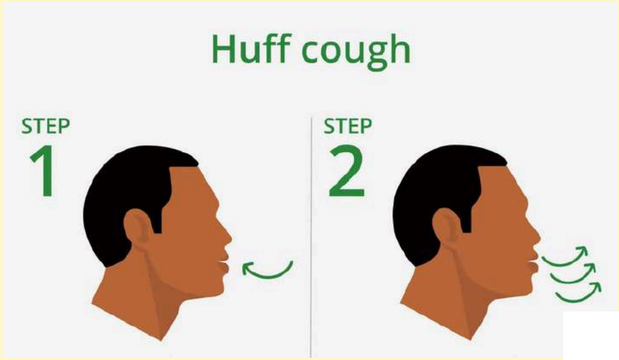
Purpose of pursed lip breathing?
Prevent air trapping

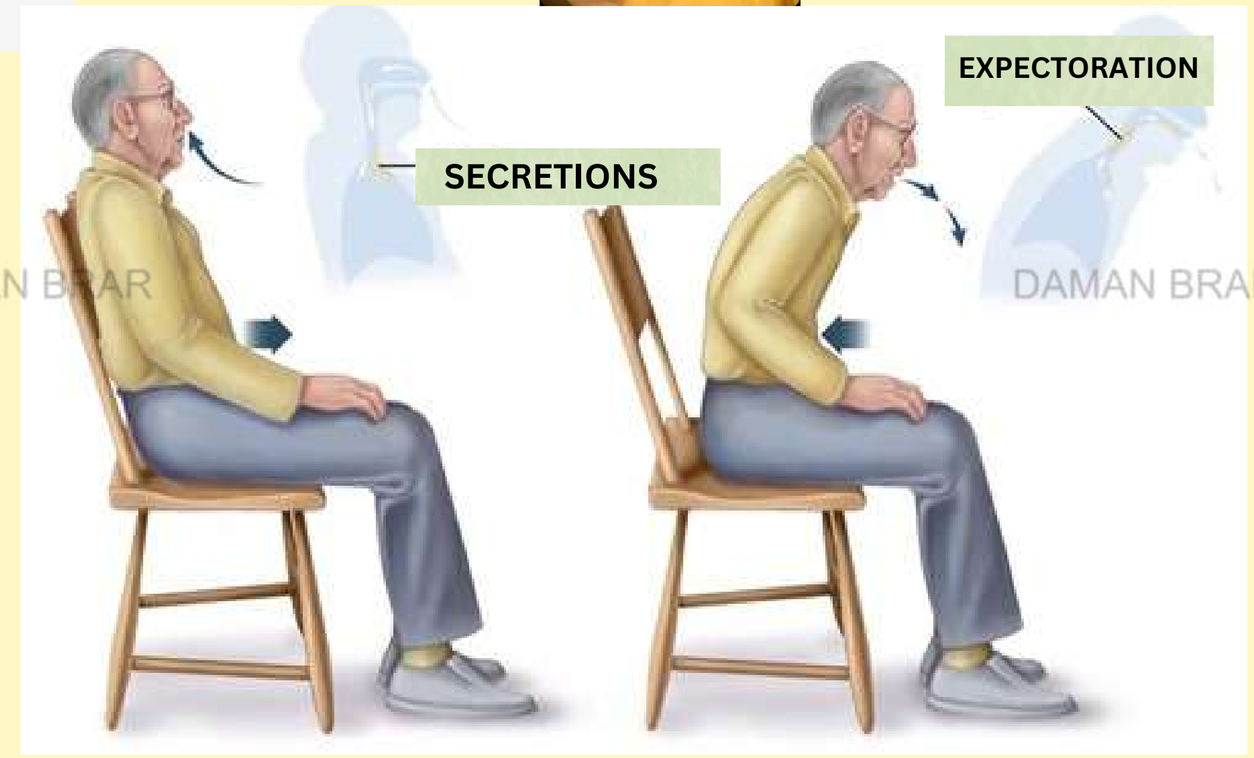
Pursed lip breathing ?
Prevent airway collapse during expiration



HUFF COUGHING TECHNIQUE

1. Sit upright in a chair: feet shoulder width apart & lean forward
2. Deep slow inhalation through mouth using diaphragm muscle
3. Hold breath: 2-3 seconds & then forcefully exhale
4. Repeat HUFF once or twice more & avoid from normal coughing
5. Rest for 5-10 normal breaths & repeat as needed until secretions clear

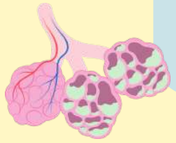




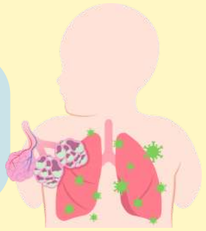
PNEUMONIA

PATHOPHYSIOLOGY

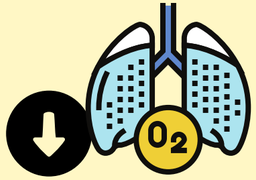
Infection that causes severe inflammation in the lungs



which makes the alveoli to fill with mucus, fluid, & debris



leading to impaired gas exchange where CO2 can't get out and oxygen now can't get IN



resulting in hypoxia
Low O2

SIGNS

Fever (100.4 f)

Altered Mental Status (Restlessness, Agitation, Confusion)

Productive cough "Yellow Sputum"

Pleuritic Chest pain

(Pleural friction rub)
Report to HCP
"Sharp chest pain upon inspiration or coughing"

Dyspnea "Shortness of Breath"

Fine or Coarse Crackles

Pleural friction rub?
Grating sound or vibration heard during inspiration and expiration

Priority Patient: who to see first?

- **Post-operative patient with suspected pneumonia temp. of 98.2F, SpO2 94% becoming restless & agitated**

CRITICAL COMPLICATIONS

1. PLEURAL EFFUSION

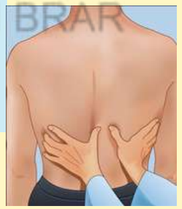
Fluid that fills the pleural space (space between the lung itself & the chest wall) This prevents full expansion of the lung, resulting in decreased gas exchange.

KEY SIGNS

- **During inhalation = Chest pain**
- **D - Dyspnea**
- **D - Diminished breath sounds**
- **D - Dull resonance on percussion**

PRIORITY TO REPORT

- **Asymmetrical Chest Expansion**
- **Decreased Breath sounds**



2. ARDS (acute respiratory distress syndrome)

Deadly STIFF lungs - ARDS - think HARDS hard stuff Lungs

KEY SIGNS

Refractory Hypoxemia = Low PaO2

REsistant to Oxygen
REfractory Hypoxemia

#1 Sign of Low O2 = Altered Mental status

- **Agitation**
- **Restlessness**
- **Confusion**

3. SEPTIC SHOCK

If the infection gets severe, the body releases chemicals into the bloodstream to fight the infection resulting in severe low blood pressure & total body inflammation which can damage multiple organs causing them to fail, known as MODS - multiple organ dysfunction syndrome

S- Shock
S - Severely Low BP & perfusion

KEY SIGNS

- **HYPOTENSION**
  Systolic < 90 mm Hg
  MAP < 65 mm Hg

- **Tachycardia**

- **Cap refill over 3 - 4 seconds**
- **Early - Fever (Over 100.4)**

- **Late - Hypothermia (Under 96.8)**
- **Elevated WBC (norm: 10,000 or less)**

- **Decreased Urine Output**
  30 ml/hr or Less = Kidney Distress

RISK FACTORS & CAUSES

#1 - ADVANCED AGE
Over 65 years old

VAP - "Ventilator Associated Pneumonia"
CARE -
1. Reposition side to side Q 2 hours
2. Oral Care & Suctioning Q 2 hours
3. Chlorhexidine

BEST INDICATORS OF VAP
- positive sputum culture
- Fever
- Chest X-ray: new infiltrates

NCLEX

Prolonged immobility - secretions are not mobilized & get stuck in body

Post-Operative - Anesthesia - the body is put to sleep which traps infection in the lungs

NURSING CARE

MOBILIZE SECRETIONS & EXPAND LUNGS

Chest physiotherapy
TCDB - turn cough & deep breath!
Huff coughing technique
AVOID cough suppressants

Fluid 2 - 3 L per day

Positioning HOB UP!
(High Fowler's)
Hypoxia in Unilateral Pneumonia?
= Good Lung Down NCLEX

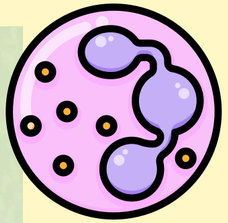
- Early ambulation (within 8 hours after surgery)
- Cough with splint

Handwashing
Mouth Care Q 12 hour
Chlorhexidine swab
Incentive Spirometer Q Hour

GIVE Pain Meds

DIAGNOSTICS

Elevated WBC - white blood cell count
Over 10,000
• Sputum Culture = Positive
TEST TIP - CULTURES ARE ALWAYS TAKEN FIRST - BEFORE ANTIBIOTICS in order to identify the causative bacteria.



Q A

Best indicator of ventilator associated pneumonia (VAP) ?
- Positive sputum culture

Q A

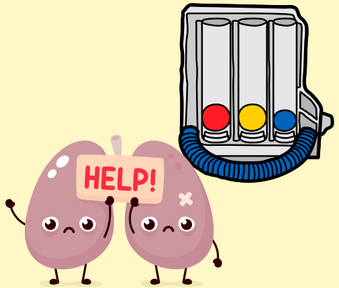
Best blood lab value shows effective treatment of pneumonia after IV antibiotics?
- White blood Cell count

DISCHARGE TEACHING

MOBILIZE SECRETIONS

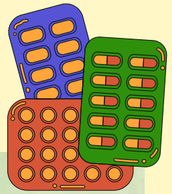
Avoid cough suppressants
Antitussives: Codeine
Cool mist humidifier at night
Increase Fluid

RE-EXPAND ALVEOLI



IS - Incentive spirometer at home

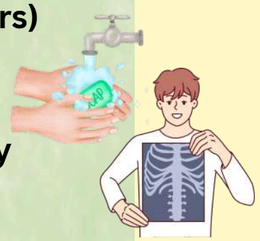
PREVENT REINFECTION



- Finish oral antibiotics at home
- Pneumonia vaccine (Every 5 years)
- Smoking cessation
- Handwashing
- Schedule follow up & Chest X-ray

Report: increased or Worsening

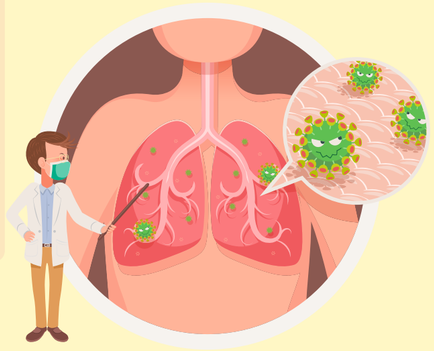
- Fever
- Confusion
- SOB, cough, sputum



Encourage 3L of fluid intake per day to promote expectoration

RESPIRATORY TUBERCULOSIS

• Bacterial infection in lungs caused by the bacteria M.Tuberculosis
• Spread via the airborne route, once inhaled it enters the lungs & spreads to the lymph & bloodstream.



SIGNS & SYMPTOMS:

- Night Sweats
- Anorexia: Weight loss

- Cough + Hemoptysis
  "Blood tinged sputum"
- Fever & chills
- Dyspnea & SOB

T	Terrible cough "blood tinged"
B	Bad infection: Fever, night sweats, weight loss

PRIVATE NEGATIVE PRESSURE ROOM DOOR CLOSED

Precautions for a patient with suspected tuberculosis (TB)?
- Airborne precautions

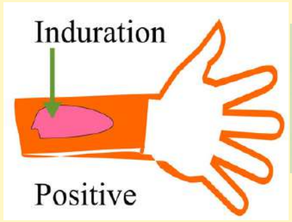
First action for a patient with night sweats, weight loss, hemoptysis, fever and chills.
- Airborne precautions

Client with anorexia, low-grade fever, night sweats and a productive cough.
- Priority action: Initiate airborne precautions.

Most accurate description of tuberculosis (TB)?
- "Most people who become infected with the TB organism, do not progress to active disease

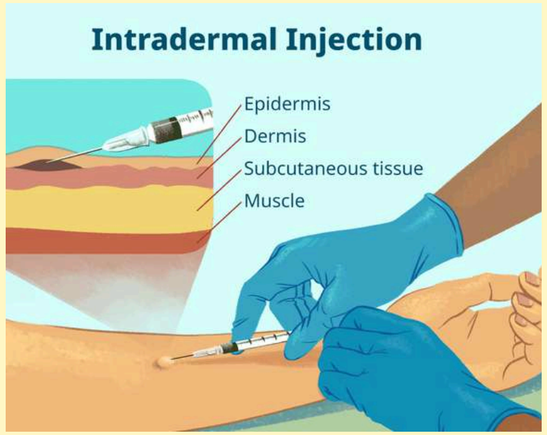
DIAGNOSTICS

Intradermal injection (mantoux test) requires a 2 to 3 day window for reading.



Over 15 mm induration = positive TST

Chest X-ray & sputum cultures test for active form



QUICK TIPS

Route of administration for Mantoux test?

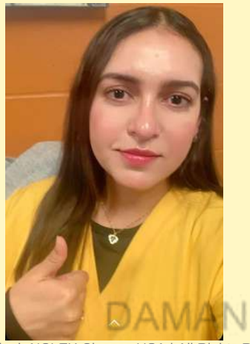
- Intradermal

DID YOU KNOW?

- Sputum cultures are taken until 3 negative cultures
- Family members should be tested for TB

SPUTUM CULTURE DIAGNOSIS

Early morning steriLe sputum specimen 3 consecutive days



TIPS

1. Meds Last 6 - 12 months
2. N-95 mask worn all the time
3. Family tested for TB
4. Sputum samples every 2 - 4 Weeks
5. 3 Negative cultures on 3 different days = NO Longer infectious

TB - DRUGS

R I P E

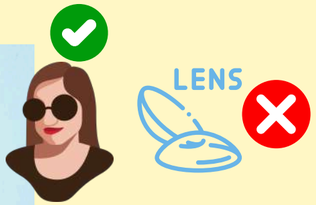
ALL DRUGS ARE LIVER TOXICS

RIFAMPIN (RED)

- Red, Orange: Tears, Urine, Sweat

TEACH:-

- Wear glasses instead of contacts due to discoloration of tears
- Oral contraceptives ineffective "Use non-hormonal Back-up birth control"
- Monitor for Jaundice



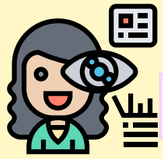
PYRAZINAMIDE

- Causes Photosensitivity , arthralgia
- Used with caution in Diabetes mellitus, gout, renal impairment

INH ISONIAZID

I - <u>INTERFERES WITH ABSORBTION OF B6 (PYRIDOXINDE)</u>
- Low Vitamin B6 = Peripheral Neuropathy
- Take Vitamin B6 25 - 50mg/d

N - <u>NEUROPATHY REPORT:-</u>
- New Numbness
- Tingling extremities
- Ataxia

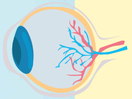


ETHAMBUTOL - Eye

KEY POINT: REPORT!
- Blurred vision
- Color changes

CONTRAINDICATE IN OPTIC NEURITIS

TEACH to have baseline eye exams and routine EYE appointments!



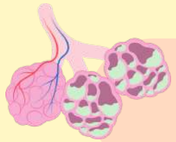
<u>H - HEPATOTOXICITY</u>
REPORT Immediately!!!
- Jaundice (yellow) Skin / Sclera
- Dark urine
- Fatigue
- Elevated liver enzymes (AST/ALT)

HOLD the Med
- Teach: NO ETOH!!

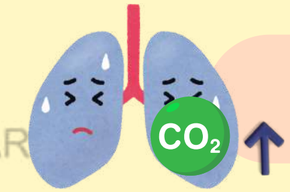
RESPIRATORY FAILURE & ARDS

PATHOPHYSIOLOGY

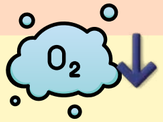
RESPIRATORY FAILURE



When the capillaries (little blood vessels in the alveoli)



can not adequately exchange CO2 for Oxygen.



CAUSES

INFECTION

- Alveoli become swollen, inflamed, & filled with mucus or fluid which blocks gas exchange!

COMMON FLU

- Clients can present with a common FLU which can progress into pneumonia & eventually into DEADLY A.R.D.S. - Acute Respiratory Distress Syndrome

ARDS

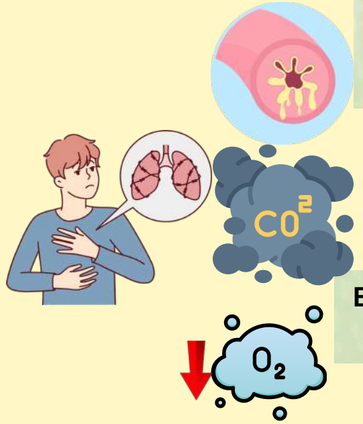
The alveoli become hard

↓

capillaries around the Alveoli becoming inflamed & fluid filled

↓

creating a leaky barrier, which eventually fills up the little alveoli sac



↓

Which makes it impossible to get oxygen in & to get CO2 OUT

↓

Eventually clients DIE from hypoxia IF they are not on a ventilator early

↓

ARDS - HARD ALVEOLI

Priority Diagnosis : Impaired gas exchange

CAUSES

- Sepsis - bloodborne infection that inflames the entire body O2 in CO2 out
- Respiratory inflammation - pneumonia, inhaled toxin, or even aspiration.
- Acute pancreatitis = HIGH risk for developing ARDS NCLEX TIP accidental release of active pancreatic enzymes & cytokines into the bloodstream - which get sucked into the lungs causing inflammation

SIGNS & SYMPTOMS

HYPOXEMIA LOW O2

#1 Sign = Altered Mental status

- Agitation
- Restlessness
- Confusion

ARDS

Refractory Hypoxemia
Low PaO2 = Despite Oxygen delivery

QUICK TIPS

REsistant to Oxygen
REfractory Hypoxemia

QUICK TIPS

LAB VALUES -
ABG Arterial Blood Gas
Low PaO2
High CO2

A.R.F. - ACUTE RESPIRATORY FAILURE

2 types:

HypOXemic failure LOW O2 (PaO2 60 or LESS)

HyperCapnic failure HIGH CO2 (PaCO2 Over 50)

Which arterial blood gas (ABG) values support suspected acute respiratory failure (ARF)?

1. PaO2 55 mm Hg, PaCO2 47 mm Hg
2. PaO2 62 mm Hg, PaCO2 32 mm Hg
3. PaO2 47 mm Hg, PaCO2 63 mm Hg
4. PaO2 82 mm Hg, PaCO2 22 mm Hg

PRIORITY INTERVENTION FOR ARDS

Mechanical Ventilation PEEP (positive end expiratory Pressure)

H High Fowler's position (HOB up)

O Oral suctioning & Oxygen

L Listen to lung sounds

Y Yell for help! Notify HCP “provider”

BRONCHOSCOPY

A procedure that allows visualization of the larynx, trachea, bronchi & deep lung using a flexible scope. The tube is inserted through the nose, mouth or endotracheal area passing the throat, so naturally a gag reflex & laryngospasm are a big concern!

POST-PROCEDURE CARE

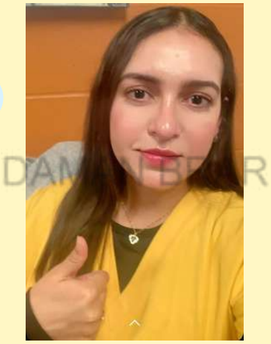
- Laryngospasm "stridor"
- Bright red blood tinged sputum Hemoptysis

priority

CALL HCP

PERFORMED FOR 3 COMMON REASONS:

- Biopsy of tissue: like when checking for cancer
- Lavage to wash out the lungs
- Suction for deep sputum or a foreign object



NORMAL & EXPECTED:

- Low RR & Low O2 saturation: the patient has had mild sedation making everything low & slow.
- Absence of gag reflex: a numbing agent has been applied to the throat.

BEFORE THE PROCEDURE

- <u>Mild sedation:</u> makes the vitals low & slow
- <u>Topical anesthetic</u> like lidocaine is applied to the throat to prevent the gag reflex

Post bronchoscopy … priority findings to report to the provider immediately? Select all that apply

- Blood tinged sputum … bright red
- Stridor and increased dyspnea

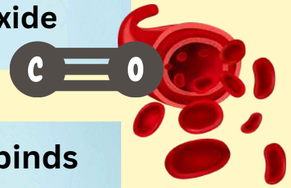
NURSING CARE

NPO - Until alert with a positive gag reflex

CARBON MONOXIDE POISONING

PATHOPHYSIOLOGY

The body replaces the oxygen in the red blood cells with carbon monoxide



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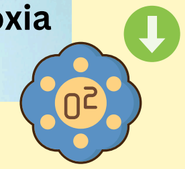
as it more easily binds to hemoglobin

↓

results in severe hypoxia leading to death



CAUSES:

- fuel burning like wood (typically in poorly ventilated areas)

- stoves

- Inhaled toxins released by cars (auto mechanic shops)

How have you been keeping your house warm?

SIGNS & SYMPTOMS

- Vague & often unnoticed symptoms
- Slight headache, dizziness, dyspnea & even nausea
- False reading of high sp02 %, but in reality the patient is very hypoxic.
- Pulse oximeter readings do not accurately reflect hypoxia with carbon monoxide toxicity.

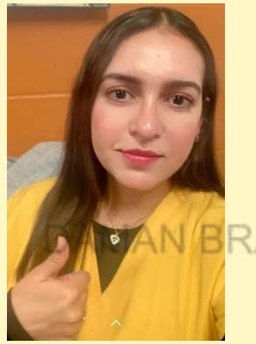
Priority

- 100% oxygen via non-rebreather mask Flow rate of 15 LPM
- This will help eliminate carbon monoxide from the body & allow oxygen to attach to red blood cells once again, solving the root cause of the hypoxia.

CYSTIC FIBROSIS

PATHOPHYSIOLOGY

Genetic disorder that causes mucus secretions to be thicker & stickier than normal. This mucus builds up in the lungs leading to recurrent respiratory infections & digestive system leading to poor weight gain & failure to thrive for younger patients.



SIGNS & SYMPTOMS

<u>Resp. Failure Priority</u>
= Oxygen Sat. & Airway
<u>Low pulse oximetry reading</u> (norm: 95 - 100%)
<u>Sudden drop</u> in oxygen saturation

COMMON "NORMAL" FINDINGS

- Recurrent lung infections & Blood-tinged sputum
- Weight Loss & Loss of appetite
- Constipation & loose, fatty stool (steatorrhea) due to mucus build up & lack of enzymes to help breakdown fat.

PHARMACOLOGY

Acetylcysteine (brand: mucomyst)

- Antidote: Acetaminophen (Tylenol) poisoning

NOT SAFE Will Worsen bronchospasm

NURSING CARE

1. Diet: High calories
Enzymes WITH meals

2. Mucus
- Increase fluid intake & Exercise
- Chest Physiotherapy Postural drainage

3. Financial counseling

DIAGNOSTICS

Not commonly tested on exams or boards

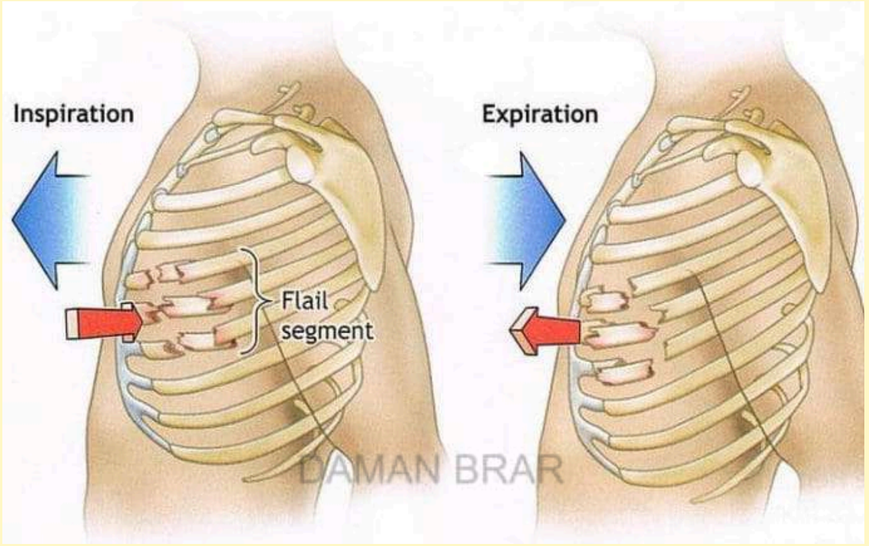
- Sweat chloride test
- DNA, Stool test

FLAIL CHEST & RIB FRACTURE

• Broken ribs typically result after any major trauma: Car accident, falls & the like.

FLAIL CHEST

A segment of the rib cage completely breaks & becomes detached from the rest of the chest wall, a life-threatening medical emergency.



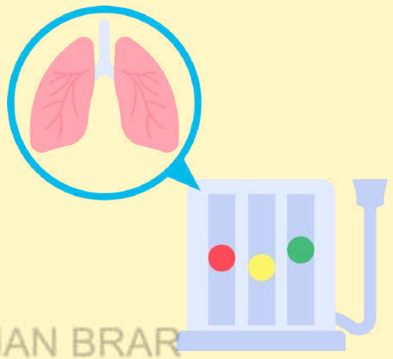
SIGNS & SYMPTOMS:

• Paradoxical chest wall movement (key sign) The ribs moves INward during inspiration & floats out during expiration
• Extreme chest pain
• Shallow respirations

NO. 1 PRIORITY PAIN CONTROL

DEADLY COMPLICATIONS

• High risk for infection Pneumonia is very common
• Hypercapnic respiratory failure from High CO2 retention, putting the body in an acidotic state.



INTERVENTIONS

1. Priority = Pain Control YES - Administer prescribed Opioids Morphine, Hydromorphone, Hydrocodone

2. Pulmonary hygiene only AFTER Pain is controlled
TCDB - Turn, cough, deep breathing
3. IS - Incentive Spirometer to re - expand the lungs & preventing atelectasis

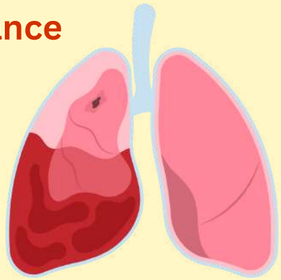
HEMOTHORAX VS. PNEUMOTHORAX

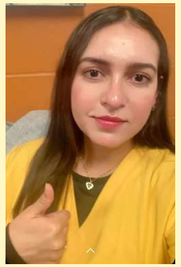
HEMOTHORAX

Blood collects in pleural space (space between lung and chest wall) resulting in lung collapse. Think hemo meaning blood like HEMOglobin.

Blood or fluid

Dull Resonance



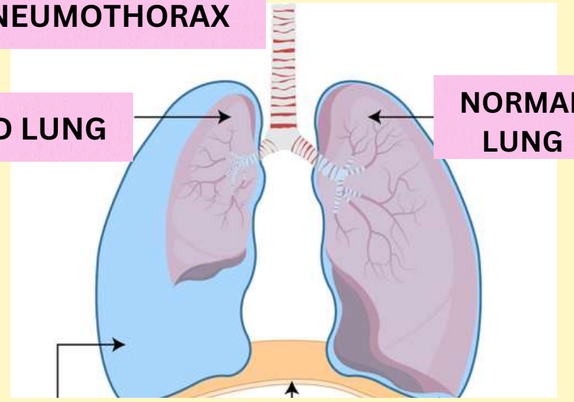


PNEUMOTHORAX

Lung collapses due to AIR in pleural space. Key sign: hyperresonance - like taping on a hollow drum or tree.

Hyperresonance

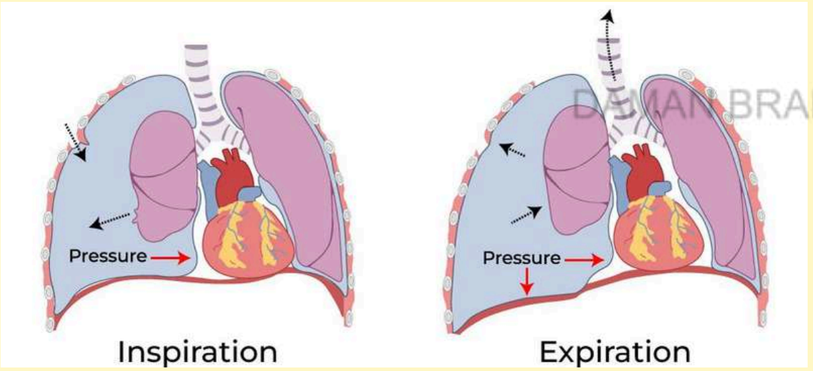
PNEUMOTHORAX



High air

TENSION PNEUMOTHORAX

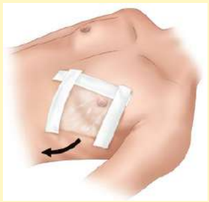
Tracheal deviation



TENSION PNEUMOTHORAX

Can result from an open pneumothorax, where air gets sucked into the pleural space when breathing in & can't get out, known as a sucking chest wound. All this built-up pressure can push organs & trachea to one side.

Dyspnea , Tachycardia, Tachypnea



TREATMENT

- Chest tube
- Open pneumothorax “sucking sound”

Cover the wound with occlusive (petroleum gauze) dressing

Tape on 3 sides

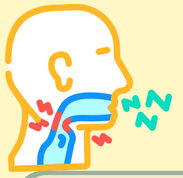
Q A

During central line placement the patient develops dyspnea and tachypnea and the provider asks for a chest tube tray...

Suspected pneumothorax

OBSTRUCTIVE SLEEP APNEA

When the tongue or muscles in the pharynx block the airway resulting in moments of no breathing & no airflow, called Apnea.



O- Obstructed
S - Snoring
A- Airway

CAUSES

- **O** Obese/overweight
- **S** Sedatives before bed, Benzos , Opiates

- **A** Alcohol

SIGNS & SYMPTOMS

DAYTIME:
- Morning headaches
- Daytime sleepiness
- Chronic fatigue
- Irritability, mood swings, depression

Night Time:
- Snoring
- Episodes of apnea

CPAP

CPAP: Continuous positive airway pressure uses a mask & air pump to push air pressure into the nose & mouth which keeps the pharynx and tongue from collapsing backward.

PATIENT EDUCATION

Lose weight / Exercise
Limit alcohol intake
NO napping during the day
NO sedatives at bedtime
NO eating bedtime snacks

1st Action:
Client on CPAP with Low O2 Sat.
- **Check tightness of straps and mask.**

Findings that support obstructive sleep apnea? Select All That Apply

1. Chronic fatigue
2. Reports going to bed early, sleeps for 8 hours, and still does not feel rested on awakening.
3. Obese man with hay fever that causes predominantly nasal symptoms

Mosted tested: Used for worsening COPD in clients who have High levels of CO2 retention (Hypercapnic). Bipap is a positive pressure machine that forcefully PUSHES air deep into the lungs giving much needed oxygen while expelling CO2! Typically last line oxygen device before endotracheal intubation.

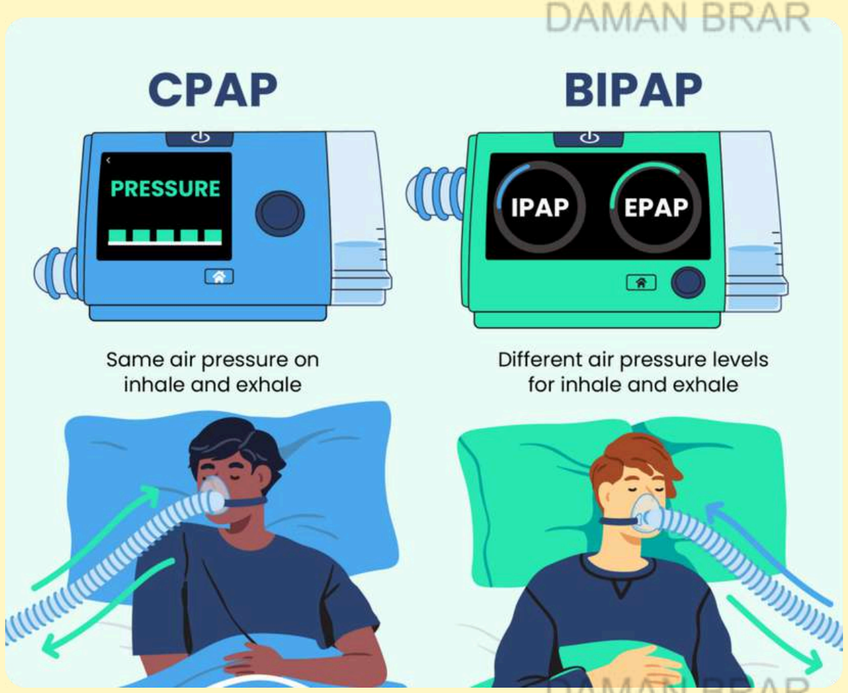
Respiratory Failure:

Hypoxemic respiratory failure = Low O2

Hypercapnic respiratory failure = HIGH CO2 (Over 45)

Priority = BiPap NCLEX TIP HyperCAP Give BiPAP

Patient who is not compliant with CPAP?
- Use BiPap instead of CPAP



Cpaps give continuous pressure during inhalation & exhalation making it more uncomfortable & BIPAP pressures accommodate for normal breathing

PLEURAL EFFUSION & THORACENTESIS

PATHOPHYSIOLOGY

Pleural Effusion think Plenty of Fluid in the lung space

↓

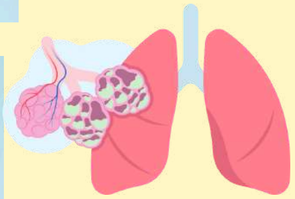
specifically fluid collection in the pleural space greater than 15 mls of fluid

↓

This fluid prevents full expansion of the lung

↓

results in decreased gas exchange & atelectasis (collapse of the alveoli)



SIGNS & SYMPTOMS:

1. Chest pain during inhalation
2. Dyspnea
3. Diminished breath sounds
4. Dull resonance on percussion

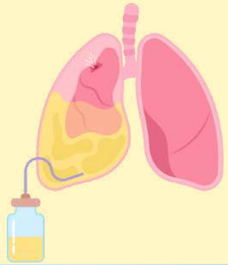
Suspected pleural effusion findings ...
“Decreased breath sounds noted in lower lobe”

Decrease breath sounds

CAUSES

- Pneumonia (lung infection), which fills the lungs with fluid.
- Heart failure causing pulmonary edema, where heavy fluid builds up in the lungs.

INTERVENTIONS

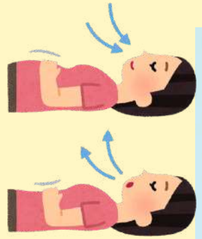


THORACENTESIS

Provider places a needle through an intercostal space (the space between the ribs) to gently puncture the lung & drain the fluid!

COMPLICATIONS

REPORT TO HCP



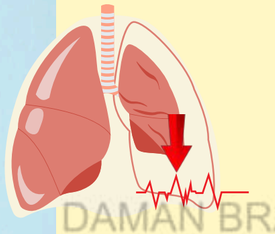
PNEUMOTHORAX

- Asymmetrical chest expansion & decreased breath sounds on affected side

Hyperresonance

h - Hyperresonance
h - high air in lungs

Deviated Trachea



BEFORE procedure:

STOP ALL BLOOD THINNERS:

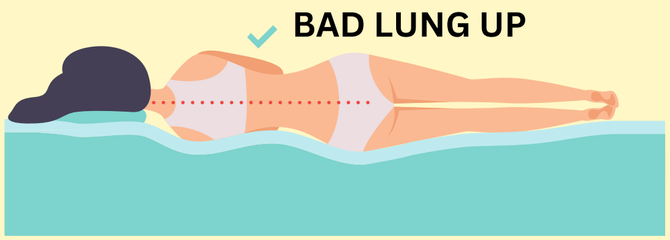
Antiplatelets: aspirin & clopidogrel
Anticoagulants: Warfarin & heparin (enoxaparin)

- Sign a consent form
- Chest X-ray before & AFTER procedure to compare fluid & lung expansion

AFTER A THORACENTESIS:

Deep breaths to help re-expand the lungs & promote adequate oxygen exchange

Lie on the unaffected lung to keep BAD LUNG UP!



Correct instructions after a thoracentesis?
Have the client take deep breaths after the procedure

PULMONARY EMBOLISM

PATHOPHYSIOLOGY

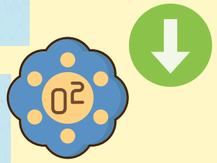
Deadly PRIORITY medical emergency

PE is a blood clot that obstructs a pulmonary vessel (blood vessel inside the lung)

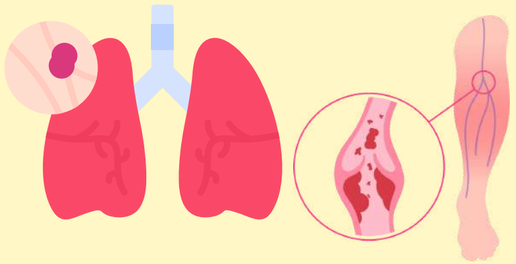
typically the pulmonary artery

This blockage prevents blood flow to the Alveoli where gas exchange is supposed to happen

eventually leading to DEADLY hypoxemia (deadly low oxygen).

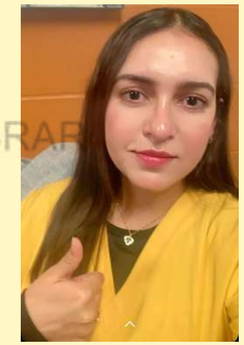


HIGHEST PRIORITY - Impaired gas exchange r/t imbalance of ventilation & perfusion



CAUSES

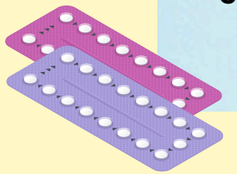
Typically caused from a DVT blood clot that loosens from another part of the body (typically the leg) & gets sucked into lungs



Risk Factors

- Smoking, Obesity, Immobility, & even cardiac issues like Atrial Fibrillation or valve disorders.

- Estrogen birth control “oral contraceptives” MOST TESTED leads to increased risk for blood clots



SIGNS & SYMPTOMS:

#1 Sign = Hypoxemia
1. Restless
2. Agitation
3. Mental status change

- Chest pain
- Dyspnea & SOB
- Tachypnea
- Tachycardia
- Anxiety

DIAGNOSTICS

HIGH D DIMER - High risk for blood clots in the body

D - Dimer (Positive)
• D - Dime sized clot in body

Indications for pulmonary embolism include...
- Positive D-Dimer

Normal range 68- 494 ng/dL)

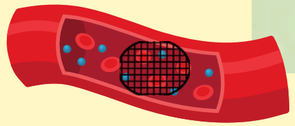
PHARMACOLOGY

ANTICOAGULANTS
Heparin
Warfarin

THROMBOLYTICS
tPA
Alteplase
Streptokinase

TREATMENTS

Surgery
• Embolectomy: surgical removal of the clot
• Vena Cava filter: acts like a net to catch any new clots



TONSILLITIS & ABSCESS

PATHOPHYSIOLOGY

Tonsillitis is the inflammation of tonsils, the little soft tissue masses located near the rear of the throat. When these guys get inflamed it can lead to a life-threatening airway obstruction!

NCLEX TIP

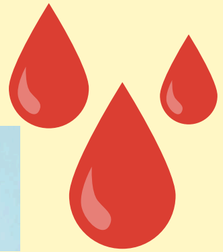
Sore throat with difficulty opening mouth and swallowing

PRIORITY

TREATMENTS

To avoid bleeding after surgery

Tonsillectomy: simple surgery to remove the tonsils, HUGE RISK for bleeding.



PATIENT TEACHING

- AVOID coughing, blowing nose
- NO milk products
- AVOID sharp foods: chips, nuts
- NO hard brushing or gargling

Priority Findings Post-Op tonsillectomy

1. Frequent swallowing
2. Restlessness
3. Persistent Coughing

CHEST TUBE

Chest tubes are used to drain fluid, blood, or air from the pleural space within the lung in order to re-expand a collapsed lung & RESTORE the normal negative pressure in the pleural space

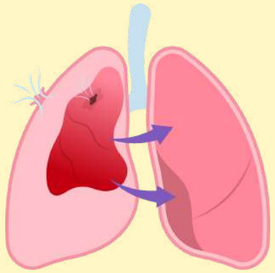
MECHANISM OF ACTION

Inserting the tube into the pleural space it simply SUCKS out all the air, fluid, or blood into a closed 1-way drainage system. Always keep the chest tube drainage system BELOW the CHEST level to help with drainage

Interventions for a client with chest tube for pneumothorax ? Keep drainage below patient's chest level

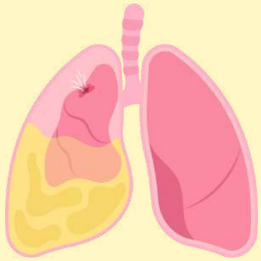
EXAMPLES -

- Pneumothorax - Air in pleural lung space



- Hemothorax - Blood in pleural lung space

- Pleural effusion - Fluid in the pleural lung space

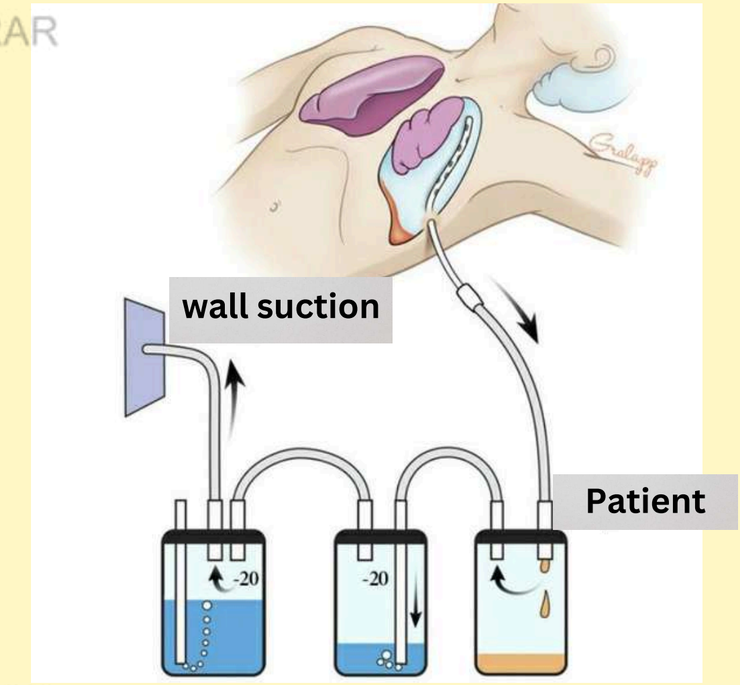


CHEST TUBE CHAMBERS

1. SUCTION CONTROL CHAMBER

"gentle, steady or continuous bubbling"

NCLEX TIP Think of a child sucking down a Mangoshake , we want gentle bubbling NOT vigorous.

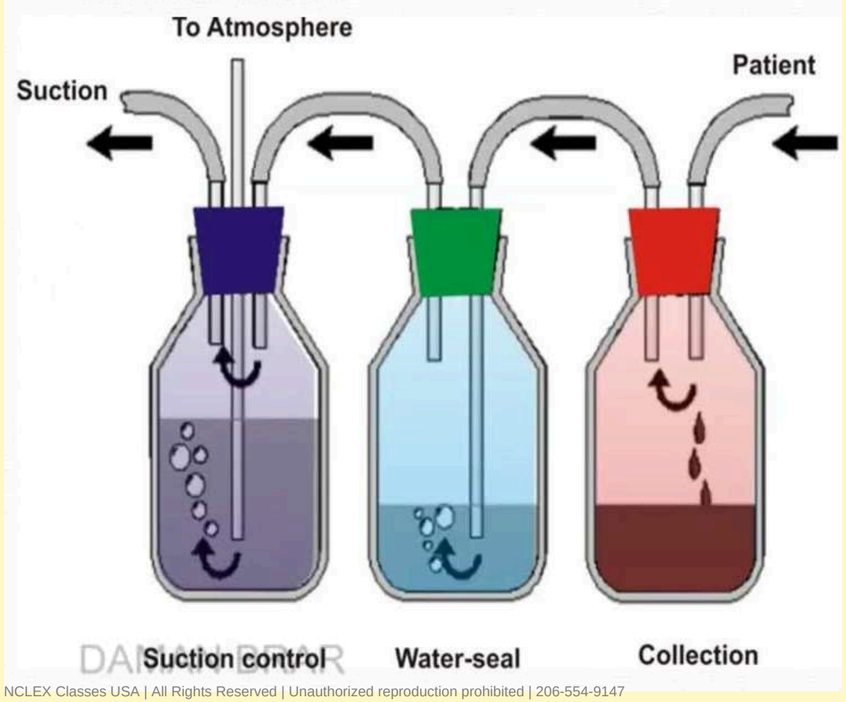


2. WATER SEAL CHAMBER & AIR LEAK MONITOR

Tidaling (rise & fall) = Good
"continuous bubbling" = BAD

Air leak monitor NCLEX TIP

EXAMPLE - WATER LEVEL IN WATER SEAL CHAMBER RISES DURING INHALATION AND FALLS DURING EXHALATION



3. COLLECTION CHAMBER

Notify HCP NCLEX TIP

"bright red blood" Over 100 ml/hr + (after 1st hour of placement)

D - Dark bloody drainage = Normal

D - Document & monitor (old blood)

Best response from the nurse when a client asks about tidaling in the water seal chamber?

- "It shows your lung has not yet re-expanded"

Possible indication of lung re-expansion?

- Tidaling in the water seal chamber has stopped

Dark Blood = Document
BRIGHT Blood = NOT RIGHT!

Essential equipment to have at the bedside of a client with closed chest drainage system?

- Sterile connector, sterile petroleum gauze, padded clamp

Interventions for a client with a chest tube for pneumothorax ...

- If the tube becomes dislodged, ask the patient to cough and exhale as much as possible

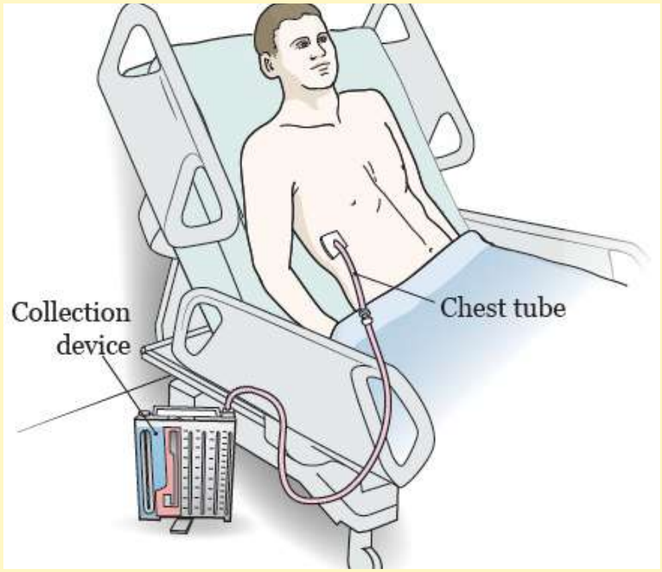
STOPPED OR DECREASED DRAINAGE?

- Auscultate lung sounds - diminished breath sounds = PRIORITY
  - Turn, cough & deep breathe
  - Reposition the patient

Priority for client with three chambered chest drainage system for hemothorax?
NCLEX TIP Assess client's respiratory status frequently

PATIENT ASSESSMENT

• Every 2 hours - listening to breath sounds, dressing around the chest tube to see if blood or pus for infection
• Subcutaneous emphysema (trapped air under the skin)



collection device always below the chest

Disconnection & Damage

Disconnected from patient

1. Cough & Exhale immediately
2. Apply occlusive (petroleum gauze) dressing secured on 3 sides

DAMAGE:
• Water Seal Chest Tube Damage
• Place distal end into 250ml sterile saline

BAD

1. NEVER “milk” “strip”
2. NEVER “continuous bubbling” in the Water seal / Air leak chamber
3. NEVER clamp during transport

CHEST TUBE REMOVAL

Take a deep breath, hold it & bear down (Valsalva maneuver)

CHEST TUBE

SUCTION PORT

CHEST DRAIN CONNECTOR

POSITIVE PRESSURE RELEASE VALVE

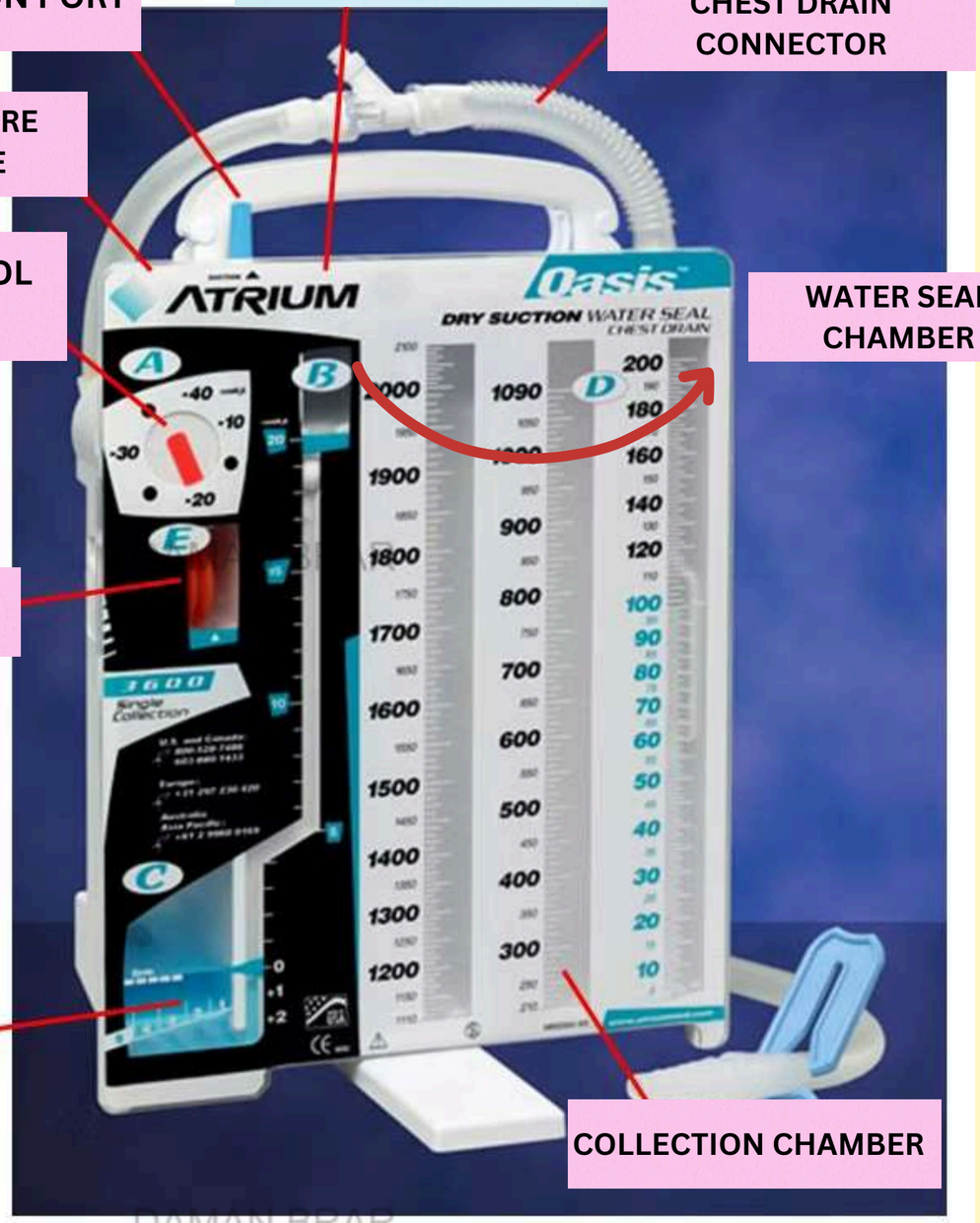
SUCTION CONTROL REGULATOR

WATER SEAL CHAMBER

SUCTION MONITOR

AIR LEAK MONITOR

COLLECTION CHAMBER



WORK SMART!