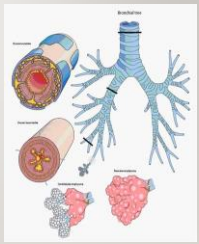
CHRONIC PULMONARY DISEASE

R.THOMAS

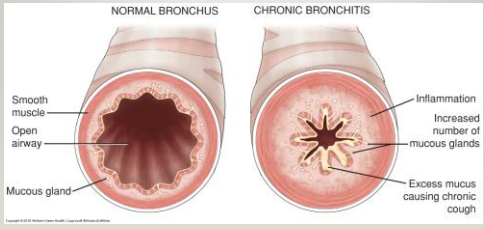
CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

- Preventable & treatable disease
- Airflow limitations that is progressive and not fully reversible
- Associated with abnormal inflammatory response of lung to noxious particles or gases
  - Chronic Bronchitis
  - Emphysema

- Pathophysiology
  - Proximal & peripheral airways, lung parenchyma pulmonary vasculature
- Chronic inflammation→ narrowing
  → enlarged submucosal gland
  → hypersecretion of mucus
  → inflammation→ fibrosis→ scar tissue & narrowing of lumen
  can develop pulmonary HTN
- Risk Factors



CHRONIC BRONCHITIS



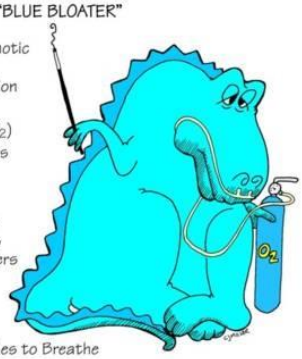
Chronic Bronchitis

- Cough and sputum production for at least 3 months in each of 2 consecutive years
- Ciliary function is reduced, bronchial walls thicken, bronchial airways narrow, and mucous may plug airways
- Alveoli become damaged, fibrosed, and alveolar macrophage function diminishes
- The patient is more susceptible to respiratory infections

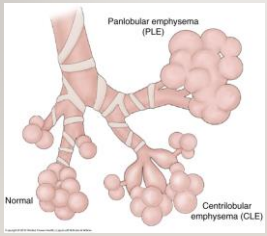
CHRONIC BRONCHITIS

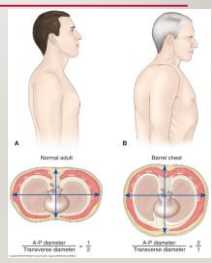
"BLUE BLOATER"

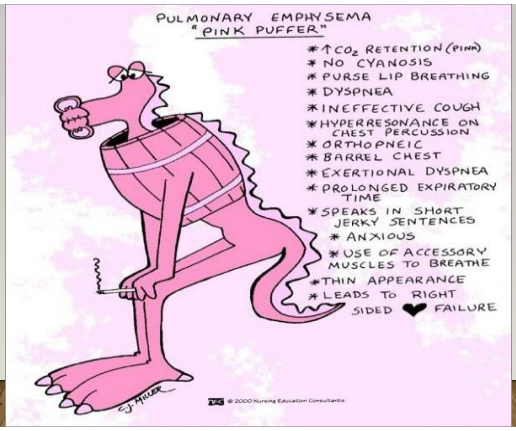
- Color Dusky to Cyanotic
- Recurrent Cough & ↑Sputum Production
- Hypoxia
- Hypercapnia (↑pCO_2)
- Respiratory Acidosis
- ↑Hbg
- ↑Resp Rate
- Exertional Dyspnea
- ↑Incidence in Heavy Cigarette Smokers
- Digital Clubbing
- Cardiac Enlargement
- Use of Accessory Muscles to Breathe
- Leads to Right-Sided Failure



EMPHYSEMA


Panlobular emphysema
(PLE)
Normal
Centrilobular
emphysema (CLE)


A
B
Normal adult
Barrel chest


PULMONARY EMPHYSEMA
"PINK PUFFER"
* ↑ CO_2 RETENTION (PINK)
* NO CYANOSIS
* PURSE LIP BREATHING
* DYSPNEA
* INEFFECTIVE COUGH
* HYPERRESONANCE ON CHEST PERCUSSION
* ORTHOPNEIC
* BARREL CHEST
* EXERTIONAL DYSPNEA
* PROLONGED EXPIRATORY TIME
* SPEAKS IN SHORT JERKY SENTENCES
* ANXIOUS
* USE OF ACCESSORY MUSCLES TO BREATHE
* THIN APPEARANCE
* LEADS TO RIGHT SIDED ❤ FAILURE
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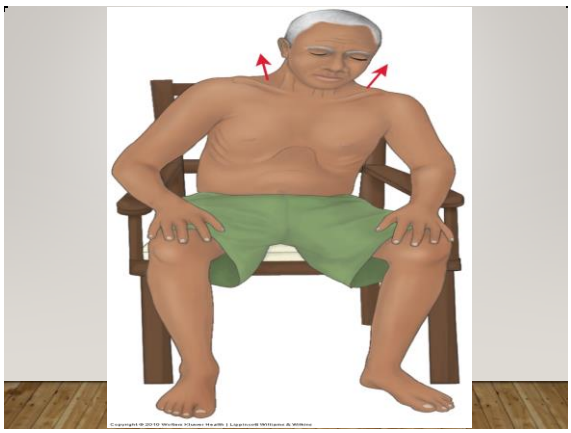


Clinical Manifestations of COPD

- Three primary symptoms
  - Chronic cough
  - Sputum production
  - Dyspnea
- Weight loss due to dyspnea
- "Barrel chest"

CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

- Assessments
  - PFTs
  - Spirometry
  - ABG
  - CXR
  - Alpha1- antitrypsin deficiency
- Classification
  - Grade I
  - Grade II
  - Grade III
  - Grade IV

Clinical Manifestations of COPD

- Three primary symptoms
  - Chronic cough
  - Sputum production
  - Dyspnea
- Weight loss due to dyspnea
- "Barrel chest"

COPD- GOALS

- Airway clearance
- Improve breathing patterns
- Improving activity tolerance
- Preventing complications
- Managing complications

EXACERBATION MANAGEMENT

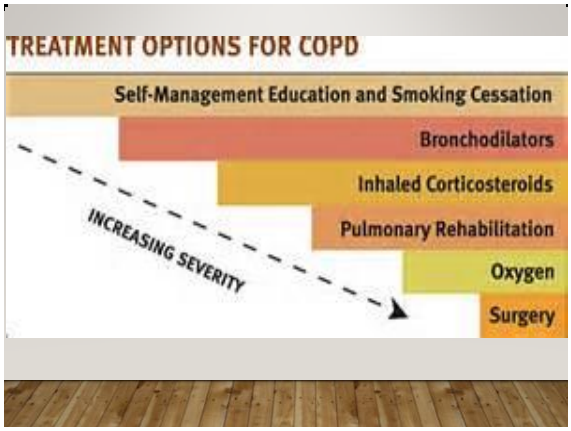
- Pharmacological
  - Bronchodilators
  - Corticosteroids
  - Alpha1-antitrypsin
  - Antibiotics
  - Antitussive and mucolytics
  - Vasodilators
  - Vaccines- flu & pneumococcal
- Oxygen- supplemental
- Surgery
  - Bullectomy
  - Lung volume reduction
  - Lung Transplantation
- Pulmonary Rehab
  - Breathing exercises
  - Activity & Self-care
  - Physical conditioning
  - Oxygen therapy

Medications to Treat COPD

- Bronchodilators, MDIs
  - Beta-adrenergic agonists
  - Muscarinic antagonists (anticholinergics)
  - Combination agents
- Corticosteroids
- Antibiotics
- Mucolytics
- Antitussives

Medical Management

- Promote smoking cessation
- Reducing risk factors
- Managing exacerbations
- Providing supplemental oxygen therapy
- Pneumococcal vaccine
- Influenza vaccine
- Pulmonary rehabilitation
- Managing exacerbations



BRONCHODILATORS

- Beta 2 Adrenergic Agonist
  - Albuterol, Ventolin, Alupent, Brethine, Foradil, Serevent diskus
- Anticholinergic
  - Atrovent
- Combo- SABA & Anticholinergic
  - Combivent, duovent
- Inhaled Corticosteroids (ICS)
  - Pulmicort, Flovent
- Combo ICS and LABA
  - Symbicort, Advair

Nursing Care of Patients with COPD

- Evaluate exposure to respiratory irritants
- Nursing interventions to promote oxygenation
  - Incentive spirometry
  - Postural drainage
  - Chest percussion and vibration
  - Breathing exercises
- Administer medications to promote gas exchange and oxygenation
  - Oxygen
  - Bronchodilators

Complications of COPD

- Respiratory insufficiency and failure
- Pneumonia
- Chronic atelectasis
- Pneumothorax
- Cor pulmonale

Education Plan for Patients with COPD

- Patient education for
  - Smoking cessation
  - Medication administration
  - Breathing exercises
  - Regular exercise
  - Realistic goals
  - Emergency management
- Refer to Chart 20-5

Home Oxygen

- Nurse instructs the patient about oxygen:
  - Safe methods for administering in the home
  - Available in gas, liquid, concentrated
  - Portable devices
  - Humidity must be provided
  - Community resources
- See Chart 20-7

BRONCHIECTASIS

- Chronic, irreversible dilation of bronchi
- Etiology
- Pathophysiology
- S/S
  - Chronic cough, purulent sputum, hemoptysis, clubbing, recurrent pulmonary infections
- Dx
- Treatment

Bronchiectasis: Clinical Manifestations and Medical Management

- Chronic cough
- Purulent sputum in copious amounts
- Clubbing of the fingers
- Postural drainage
- Chest physiotherapy
- Smoking cessation
- Antimicrobial therapy
- Bronchodilators and mucolytics

Bronchiectasis: Nursing Management

- Focus is on alleviating symptoms and clearing pulmonary secretions
- Patient teaching
  - Smoking cessation
  - Postural drainage
  - Early signs and symptoms of respiratory infections
  - Conserving energy

ASTHMA

- Pathophysiology
  - Airway hyperresponsiveness, hypersecretion of mucus, reversible airflow limitation
- Predisposing factors
  - Atopy, female gender
- Etiology
  - Allergen, sensitizers
- Contributing factors
  - Respiratory infections, air pollution, smoking, diet, small size at birth

ASTHMA

- S/S
  - Cough, dyspnea, wheezing
- Dx
  - Pulse ox, ABG, CXR
  - ↑ eosinophils & IgE
- Monitoring
  - Peak Flow
- Prevention
- Complications

Clinical Manifestations

- Cough, dyspnea, wheezing
- Exacerbations
  - Cough, productive or not
  - Generalized wheezing
  - Chest tightness and dyspnea
  - Diaphoresis
  - Tachycardia
  - Hypoxemia and central cyanosis

Medications Management for Asthma

- Stepwise, refer to Figure 24-7
- Quick-relief medications
  - $Beta_2$-adrenergic agonists
  - Anticholinergics
- Long-acting medications
  - Corticosteroids
  - Long-acting $beta_2$-adrenergic agonists
  - Leukotriene modifiers

QUICK RELIEF MEDICATIONS

- Inhaled Short Acting
  - Albuterol, Xopenex, Maxair, Alupent
- Anticholinergic
  - Atrovent
- Corticosteroids
  - Methylprednisolone, prednisolone, prednisone

Long Acting Medications	
Inhaled Corticosteroids	Pulmicort, flovent, aero-bid
Systemic Corticosteroids	Medrol, prelone, deltasone
Long Acting Beta 2	Serevent diskus, Albuterol oral
Methylxanthines	theophylline
Combined meds	Advair, Symbicort
Leukotriene Modifiers	Singulair
Cromolyn & nedocromil	Cromolyn & nedocromil
5- Lipoxygenase inhibitor	Zyflo
Immunomodulators	Xolair

PEAK FLOW MONITORING

- Green zone
- Yellow zone
- Red zone

Patient Teaching for Asthma

- How to identify and avoid triggers
- Proper inhalation techniques
- How to perform peak flow monitoring
- How to implement an action plan
- When and how to seek assistance

STATUS ASTHMATICUS

- Severe and persistent asthma
- Does not respond to therapy
- Pathophysiology
  - Severe bronchospasm, asphyxia
- S/S
- Dx
- Treatment

Cystic Fibrosis

- Most common autosomal recessive disease among the Caucasian population
- Genetic screening to detect carriers
- Genetic counseling for couples at risk
- Genetic mutation changes chloride transport which leads to thick, viscous secretions in the lungs, pancreas, liver, intestines, and reproductive tract
- Respiratory infections are the leading cause of morbidity and mortality

Medical Management of CF

- Chronic: control of infections; antibiotics
- Acute: aggressive therapy involves airway clearance and antibiotics based on results of sputum cultures
- Anti-inflammatory agents
- Corticosteroids; inhaled, oral, IV during exacerbations
- Inhaled bronchodilators
- Oral pancreatic enzyme supplementation with meals
- Cystic fibrosis transmembrane conductance regulator (CFTR) modulators are a new class of drugs and help to improve function of the defective CFTR protein

Nursing Management of CF

- Strategies that promote removal of pulmonary secretions
  - CPT and breathing exercises
- Remind patient to reduce risk factors for resp infection
- Adequate fluid and electrolyte intake
- Palliative care
- Discuss end-of-life issues and concerns