

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

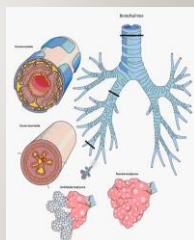
• Pathophysiology

- Proximal & peripheral airways, lung parenchyma, pulmonary vasculature

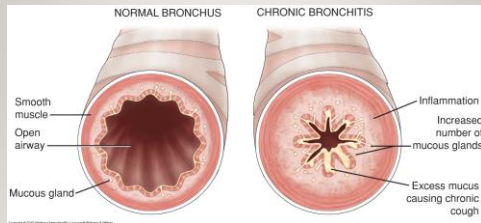
• Chronic inflammation → narrowing

- 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

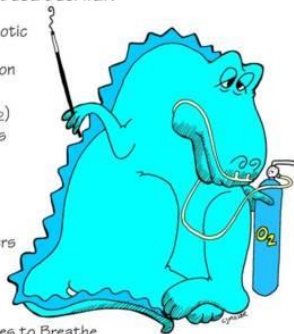
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CHRONIC BRONCHITIS

"BLUE BLOATER"

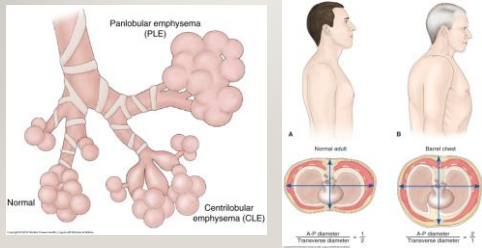
- * Color Dusky to Cyanotic
- * Recurrent Cough & ↑ Sputum Production
- * Hypoxia
- * Hypercapnia (↑ pCO₂)
- * Respiratory Acidosis
- * ↑ Hgb
- * ↑ Resp Rate
- * Exertional Dyspnea
- * ↑ Incidence in Heavy Cigarette Smokers
- * Digital Clubbing



- * Cardiac Enlargement
- * Use of Accessory Muscles to Breathe
- * Leads to Right-Sided Failure

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EMPHYSEMA







Clinical Manifestations of COPD

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

CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

- | | |
|---|--|
| <ul style="list-style-type: none"> • Assessments <ul style="list-style-type: none"> • PFTs • Spirometry • ABG • CXR • Alpha 1 - antitrypsin deficiency | <ul style="list-style-type: none"> • Classification <ul style="list-style-type: none"> • Grade I • Grade II • Grade III • Grade IV |
|---|--|

Clinical Manifestations of COPD

- ❖ Three primary symptoms
 - Chronic cough
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- ❖ Weight loss due to dyspnea
- ❖ "Barrel chest"

COPD- GOALS

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

EXACERBATION MANAGEMENT

- | | |
|--|---|
| <ul style="list-style-type: none"> • Pharmacological <ul style="list-style-type: none"> • Bronchodilators • Corticosteroids • Alpha I -antitrypsin • Antibiotics • Antitussive and mucolytics • Vasodilators • Vaccines- flu & pneumococcal • Oxygen- supplemental | <ul style="list-style-type: none"> • Surgery <ul style="list-style-type: none"> • Bullectomy • Lung volume reduction • Lung Transplantation • Pulmonary Rehab <ul style="list-style-type: none"> • Breathing exercises • Activity & Self-care • Physical conditioning • Oxygen therapy |
|--|---|

Medications to Treat COPD

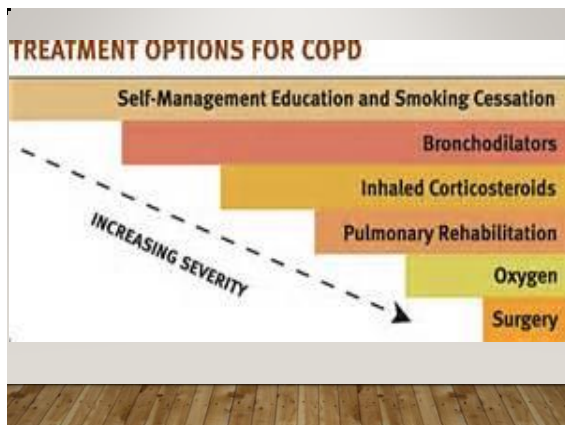
- ❖ Bronchodilators, MDIs
 - Beta-adrenergic agonists
 - Muscarinic antagonists (anticholinergics)
 - Combination agents
- ❖ Corticosteroids
- ❖ Antibiotics
- ❖ Mucolytics
- ❖ Antitussives

Medical Management

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

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BRONCHODILATORS

- Beta 2 Adrenergic Agonist
 - Albuterol, Ventolin, Alupent, Brethine, Foradil, Serevent diskus
- Anticholinergic
 - Atrovent
- Combo- SABA & Anticholinergic
 - Combivent, duvent
- 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



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Complications of COPD

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



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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



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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

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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

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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

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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

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Medications Management for Asthma

- ❖ Stepwise, refer to Figure 24-7
- ❖ Quick-relief medications
 - Beta₂-adrenergic agonists
 - Anticholinergics
- ❖ Long-acting medications
 - Corticosteroids
 - Long-acting beta₂-adrenergic agonists
 - Leukotriene modifiers

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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, predlone, daltasone
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	Xplair

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



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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



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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