

# Chapter 31

## Nursing Care of Patients with Lower Respiratory Tract Disorders

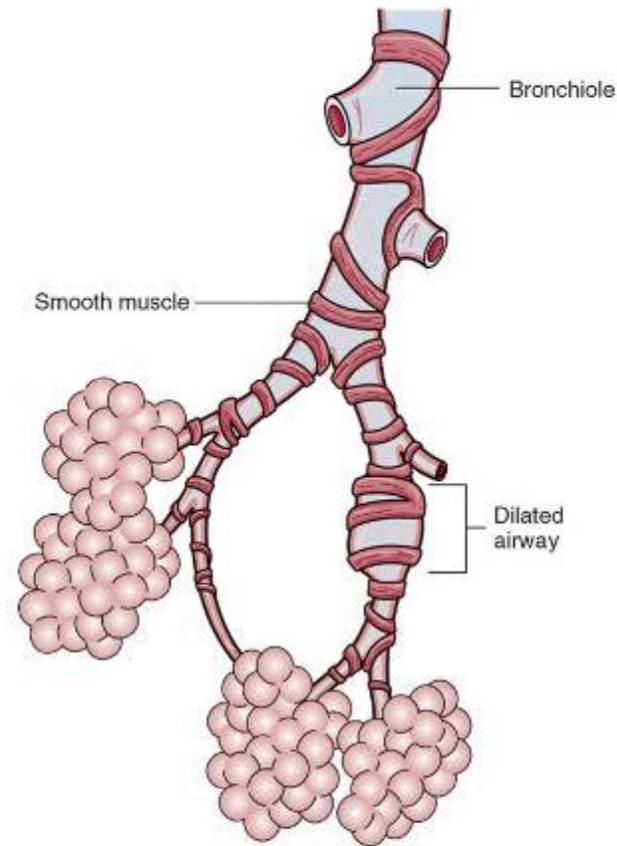
## Bronchiectasis

### Pathyphysiology

- ◆ Chronic Infection
- ◆ Dilation of One or More Large Bronchi
- ◆ Airway Obstruction

### ■ Etiology

- ◆ Secondary to CF, Asthma, TB



# Signs and Symptoms

- Dyspnea
- Cough
- Large Amounts of Sputum
- Anorexia
- Recurrent Infection
- Clubbing
- Crackles and Wheezes

## Diagnosis

- X-Ray
- CT Scan
- Sputum Culture
- Tests to Find Underlying Cause

## Therapeutic Interventions

- Antibiotics
- Mucolytics, Expectorants
- Bronchodilators
- Chest Physiotherapy
- Oxygen
- Surgical Resection

## Pneumonia

- Pathophysiology
  - ◆ Acute Lung Infection
  - ◆ Inflammation and Alveolar Damage
  - ◆ Alveoli Filled with Exudate
  - ◆ Reduced Surface Area for Gas Exchange

## Etiology

- Bacteria, Usually *Streptococcus pneumoniae*
- Virus
- Fungus
- Aspiration
- Artificial Ventilation (VAP)
- Hypostasis
- Chemical

## At Risk

- Very Young
- Elderly
- Hospitalized
- Intubated
- Immunocompromised

## Prevention

- Pneumococcal Vaccine
- Flu Vaccine
- Coughing and Deep Breathing
- Hand Washing
- Frequent Mouth Care, Continuous Suction for VAP

## Signs and Symptoms

- Chest Pain
- Fever, Chills
- Cough, Dyspnea
- Yellow, Rusty, or Blood-Tinged Sputum
- Crackles, Wheezes
- Malaise

## Signs and Symptoms in Elderly

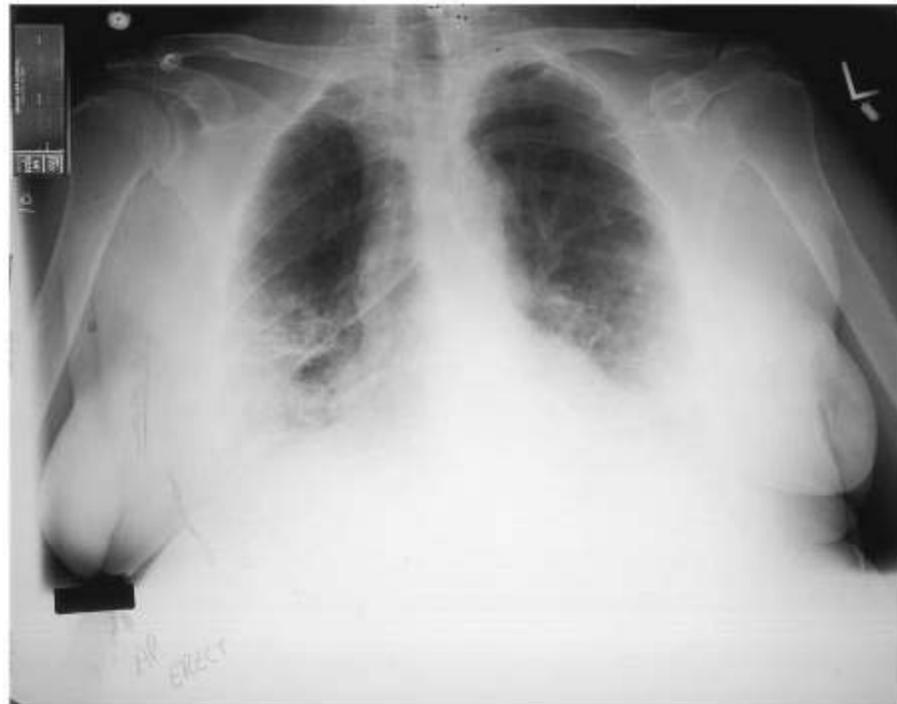
- New-Onset
  - ◆ Confusion
  - ◆ Lethargy
  - ◆ Fever
  - ◆ Dyspnea

## Complications

- Pleurisy
- Pleural Effusion
- Atelectasis
- Spread of Infection

## Diagnosis

- Chest X-Ray
- Sputum Culture
- Blood Cultures



## Therapeutic Interventions

- Antibiotics - PO or IV
- Antiviral Medication (Zovirax)
- Bronchodilators
- Expectorants
- Oxygen
- Fluids

## Tuberculosis

- Pathophysiology
  - ◆ AFB Implant on Bronchioles or Alveoli
  - ◆ Tubercle Formed
  - ◆ Immune System Keeps in Check
  - ◆ 5%-10% Infected Become Ill
  - ◆ May Activate with Impaired Immunity

## At Risk

- Elderly
- Alcoholics
- Crowded Living Conditions
- New Immigrants
- HIV

## Signs and Symptoms

- Cough
- Blood-Tinged Sputum
- Night Sweats
- Anorexia and Weight Loss
- Low-Grade Fever
- Dyspnea, Chest Pain (Late)

## Diagnostic Tests

- PPD Skin Test
- Chest X-Ray
- Sputum Cultures
- QuatiferON-TB Gold

## Therapeutic Interventions

- Combination of Drugs for 6 - 24 Months
  - ◆ INH
  - ◆ Rifampin
  - ◆ Streptomycin
  - ◆ Ethambutol
- Occasional Surgical Removal
- Isolation

## Nursing Diagnoses: Lower Respiratory Disorders

- Impaired Gas Exchange
- Ineffective Airway Clearance
- Ineffective Breathing Pattern
- Activity Intolerance

## Impaired Gas Exchange

- Monitor
  - ◆ Lung Sounds, Respiratory Rate and Effort
  - ◆ Dyspnea
  - ◆ Mental Status
  - ◆ SaO<sub>2</sub>, ABGs
- Position
  - ◆ Fowler's
  - ◆ Good Lung Down
- Administer Oxygen
- Teach Breathing Exercises
- Discourage Smoking

## Ineffective Airway Clearance

- Monitor
  - ◆ Lung Sounds
  - ◆ Sputum
- Encourage
  - ◆ Fluids
  - ◆ Deep Breathing
  - ◆ Coughing
- Administer Expectorants
- Turn q2h or Ambulate
- Suction prn
- Consider CPT or Mucus Clearance Device

## Ineffective Breathing Pattern

- Monitor
  - ◆ Respiratory Rate, Depth, Effort
  - ◆ ABGs, SaO<sub>2</sub>
- Determine/Treat Cause
- Position
- Teach Diaphragmatic Breathing

## Activity Intolerance

- Monitor Response to Activity
  - ◆ Vital Signs
  - ◆ SaO<sub>2</sub>
- Use Portable O<sub>2</sub> for Ambulation
- Allow Rest Between Activities
- Obtain Bedside Commode
- Increase Activity Slowly
- Refer to Pulmonary Rehabilitation

## Additional Diagnoses for TB

- Risk for Ineffective Management of Therapeutic Regimen
  - ◆ Teach Patient and Family
  - ◆ Consider Visiting Nurse/DOT
- Risk for Infection Transmission
  - ◆ Teach Patient and Family
  - ◆ Maintain Isolation Precautions

## Prevention of TB Spread

- Clean, Well-Ventilated Living Areas
- Isolation of Patients who have Active TB
- High-Efficiency Filtration Masks
- Gowns, Gloves, Goggles If Contact with Sputum Likely

## Restrictive Disorders

- Reduced Compliance
- Limited Chest Wall Expansion

## Pleurisy

- Pathophysiology
  - ◆ Inflammation of Visceral and Parietal Pleurae
  - ◆ Friction Between Pleurae on Inspiration
- Etiology
  - ◆ Secondary to Pneumonia, TB, CA, PE

## Signs and Symptoms

- Sharp Pain on Inspiration
- Shallow Breathing
- Fever, Elevated WBC
- Friction Rub

## Diagnostic Tests

- Chest X-Ray
- CBC
- FVC, FEV<sub>1</sub>
- Tests to Determine Cause

## Therapeutic Interventions

- Pain Management
- Treat Underlying Cause

# Pleural Effusion

- Pathophysiology
  - ◆ Excess Fluid Between Visceral and Parietal Pleurae
  - ◆ Pleural Fluid Not Reabsorbed
  - ◆ May Collapse Lung

## Etiology

- Transudative
  - ◆ Heart Failure
  - ◆ Liver or Kidney Disease
- Exudative
  - ◆ Pneumonia
  - ◆ TB
  - ◆ CA

## Signs and Symptoms

- Dyspnea
- Pain
- Cough
- Tachypnea
- Diminished Lung Sounds

## Diagnostic Tests

- Chest X-Ray
- Thoracentesis
- Tests to Determine Cause

# Therapeutic Interventions

- Treat Underlying Cause
- Analgesics
- Thoracentesis/Chest Tube

## Pulmonary Fibrosis

- Pathophysiology
  - ◆ Injury to Alveoli
  - ◆ Scarring, Fibrosis
  - ◆ Impaired Gas Exchange
- Etiology
  - ◆ Heredity
  - ◆ Virus
  - ◆ Environmental/  
Occupational  
Exposure
  - ◆ Immune Dysfunction
  - ◆ Idiopathic

# Signs and Symptoms

- Progressive Dyspnea
- Crackles
- Chronic Cough
- Fatigue
- Clubbing

## Diagnosis

- Chest X-Ray
- CT Scan
- Bronchoscopy
- Lung Biopsy
- ANA Titre

## Therapeutic Interventions

- Glucocorticoids
- Immune Suppressants
- Smoking Cessation
- Oxygen
- Flu/Pneumonia Vaccines
- Pulmonary Rehabilitation
- Lung Transplant

## Atelectasis

- Pathophysiology
  - ◆ Collapse of Alveoli
- Etiology
  - ◆ Hypoventilation

## Signs and Symptoms

- Fine Crackles
- Diminished Breath Sounds
- Dyspnea

## Therapeutic Interventions

- Prevention
  - ◆ Cough and Deep Breathe
  - ◆ Incentive Spirometer
  - ◆ Turn
  - ◆ Ambulate

## Nursing Diagnoses: Restrictive Disorders

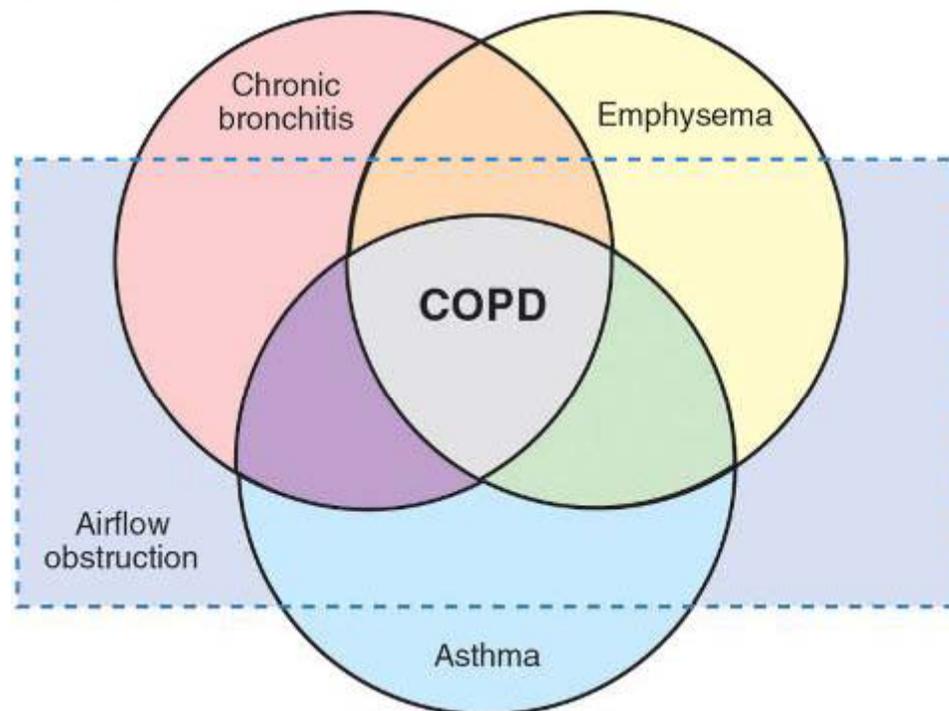
- Impaired Gas Exchange
- Ineffective Breathing Pattern
- Acute Pain

## Obstructive Disorders

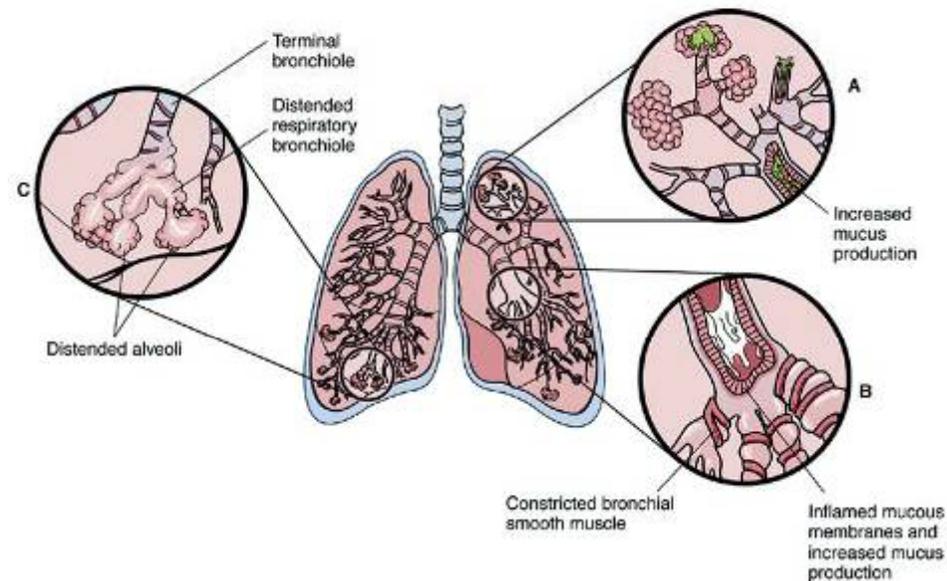
- Airway Obstruction
- Difficult Exhalation

## COPD

- Combination of
  - ◆ Chronic Bronchitis
  - ◆ Emphysema
  - ◆ (Asthma)
- Chronic Airflow Limitation



## COPD (cont'd)



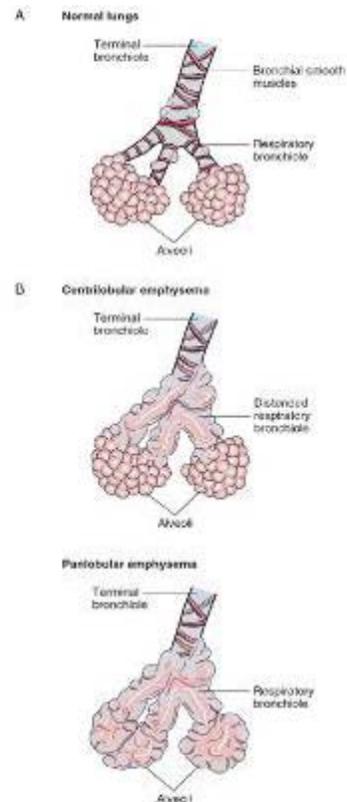
## Pathophysiology

- Chronic Bronchitis
  - ◆ Chronic Inflammation
  - ◆ Low-Grade Infection
  - ◆ Hypertrophied Mucous Glands in Bronchi
  - ◆ Impaired Ciliary Function
  - ◆ Ineffective Airway Clearance
- Diagnosed After Ill 3 Months of Year for 2 Consecutive Years

## Pathophysiology (cont'd)

- Emphysema
  - ◆ Destruction of Alveolar Walls
  - ◆ Loss of Elastic Recoil
  - ◆ Damage to Pulmonary Capillaries
  - ◆ Air Trapping
  - ◆ Impaired Gas Exchange

## Types of Emphysema



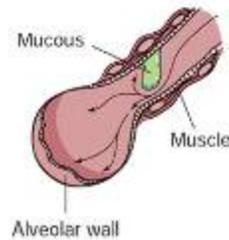
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## Air Trapping

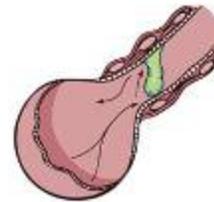
AIR TRAPPING IN CHRONIC AIRFLOW LIMITATION

A. Air trapping from excess mucous

Air movement  
during inspiration

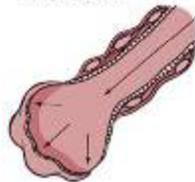


Air trapping  
during expiration

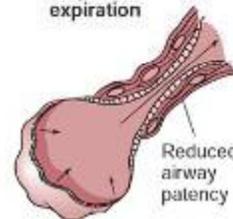


B. Air trapping from decreased elastic recoil and narrowed airways

Normal  
inspiration



Impaired  
expiration

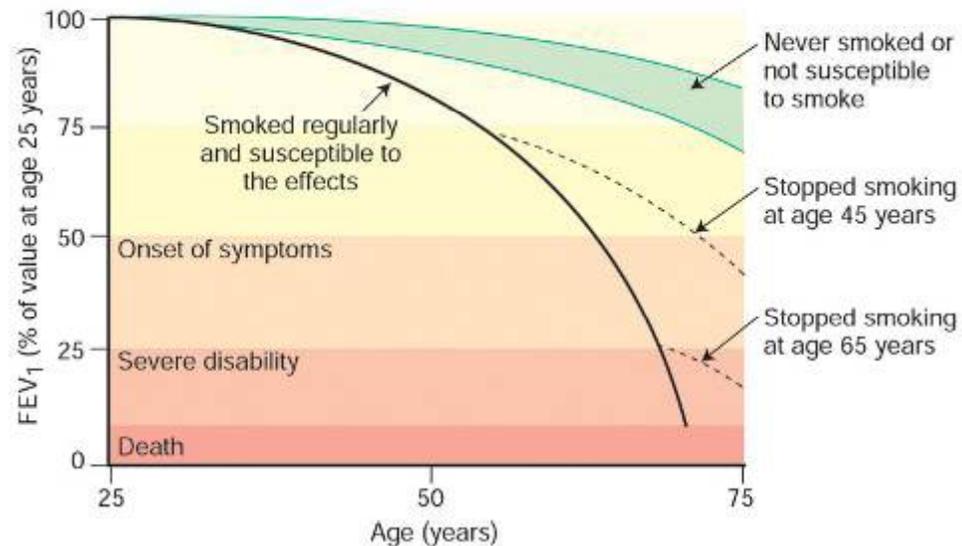


Air trapped due to  
decreased elastic recoil of  
alveolus and collapsed airway

## COPD Etiology

- Smoking
- Passive Smoke Exposure
- Pollutants
- Familial Predisposition
- $\alpha_1$ AT Deficiency (Emphysema)

## Effects of Smoking



## Prevention

**Smoking!!**



## Signs and Symptoms

- Cough
- Sputum Production
- Dyspnea
- Prolonged Expiration
- Barrel Chest
- Activity Intolerance

## Chronic Bronchitis Signs and Symptoms

- Wheezing, Crackles
- Chronic Cough
- Dyspnea
- Thick, Tenacious Sputum
- Increased Susceptibility to Infection
- Mucous Plugs

# Emphysema Signs and Symptoms

- Diminished Breath Sounds
- Dyspnea
- Progressive Activity Intolerance

# Complications of COPD

- Cor Pulmonale
- Weight Loss
- Pneumothorax
- Respiratory Failure

## Diagnostic Tests

- Chest X-Ray
- CT Scan
- ABGs
- CBC
- Spirometry
- Sputum Analysis

## Therapeutic Interventions

- Stop Smoking!!
- Oxygen 1-2 L/m
- Supportive Care
- Pulmonary Rehab
- Surgery
- Mechanical Ventilation
- End-of-Life Planning
- Medications
  - ◆ Bronchodilators
  - ◆ Corticosteroids
  - ◆ Expectorants
- NMT/MDI

# Pulmonary Rehabilitation



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## Asthma

- Pathophysiology
  - ◆ Inflammation of Bronchial Mucosa
  - ◆ Spasm of Bronchial Smooth Muscles
  - ◆ Air Trapping
  - ◆ Reversible

## Etiology

- Heredity
- Pollution
- Smoking

## Triggers

- Smoking
- Allergens
- Infection
- Sinusitis
- Stress
- GERD

## Signs and Symptoms

- Dyspnea
- Wheezing
- Cough
- Sputum
- Use of Accessory Muscles
- May Be Worse at Night

## Complication

- Status Asthmaticus
  - ◆ Severe, Sustained Asthma
  - ◆ Worsening Hypoxemia
  - ◆ Respiratory Alkalosis Progresses to Respiratory Acidosis
  - ◆ May Be Life Threatening

## Diagnostic Tests

- History and Physical Examination
- Spirometry
- ABGs
- Allergy Skin Testing

## Therapeutic Interventions

- Monitor with Peak Flow Meter
- Avoid Triggers
- Avoid Smoking



# Understanding Medical Surgical Nursing, 3rd Edition

Linda S. Williams / Paula D. Hopper

## Peak Flow Chart

Name _____														
Green zone _____			Yellow zone _____				Red zone _____							
Date														
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
800														
750														
700														
650														
600														
550														
500														
450														
400														
350														
300														
250														
200														
150														
100														
Notes														

# Therapeutic Interventions (cont'd)

- Bronchodilators
  - ◆ Adrenergic (Ventolin, Serevent)
  - ◆ Leukotriene Inhibitors (Accolate, Singulair)
  - ◆ Theophylline (Rare)

## Therapeutic Interventions (Cont'd)

- Corticosteroids
  - ◆ Inhaled, IV, PO
- Mast Cell Inhibitors (Exercise Induced)
- Antihistamines
- Oxygen PRN

## Cystic Fibrosis

- Pathophysiology
  - ◆ Exocrine Gland Disorder
  - ◆ Thick Tenacious Secretions
  - ◆ Blocked Pancreatic Enzymes
- Etiology
  - ◆ Heredity

## Signs and Symptoms

- Thick Tenacious Sputum
- Frequent Respiratory Infections
- Finger Clubbing
- Malabsorption
- Fatty, Foul Smelling Stools
- Death From Antibiotic-resistant Infection

# Diagnostic Tests

- Kiss Your Baby Campaign
- Sweat Chloride Test

## Therapeutic Interventions

- Hydration
- Inhaled Mucolytic Medication
- Bronchodilators, Corticosteroids
- Expectorants
- Chest Physiotherapy
- Antibiotics

## Therapeutic Interventions (Cont'd)

- Prevent Infection
- Pancreatic Enzyme Replacement  
(Pancrease, Viokase)
- Ibuprofen May Slow Lung Deterioration
- Lung Transplant

## Nursing Diagnoses: COPD

- Impaired Gas Exchange
- Ineffective Airway Clearance
- Ineffective Breathing Pattern
- Activity Intolerance
- Imbalanced Nutrition
- Anxiety

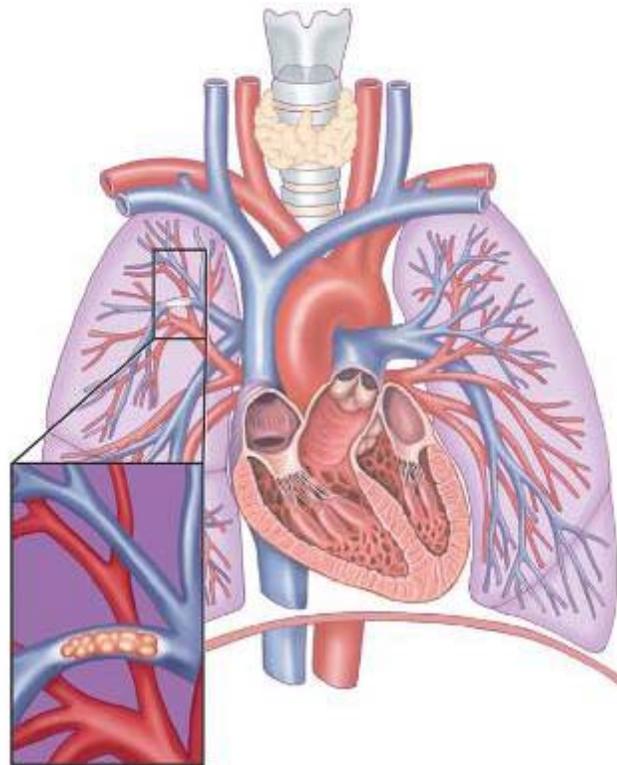
## Patient Education

- Assist Patient to Stop Smoking!
- Pulmonary Rehabilitation
- Breathing Exercises
- Energy Conservation

# Pulmonary Embolism

- Pathophysiology
  - ◆ Blood Clot in Pulmonary Artery
  - ◆ Ventilation-Perfusion Mismatch
  - ◆ Impaired Gas Exchange
  - ◆ Lung Infarction

# Pulmonary Embolism



Pulmonary embolism

## Etiology

- DVT Most Common
- Fat Emboli From Compound Fracture
- Amniotic Fluid Emboli During L&D

## Prevention of PE

- Regular Ambulation
- Prompt Treatment of DVT
- In High-risk Patients
  - ◆ Warfarin (Coumadin)
  - ◆ Enoxaparin
  - ◆ Heparin

## Signs and Symptoms

- Sudden Onset Dyspnea
- Tachycardia
- Tachypnea
- Cough
- Crackles
- Hemoptysis

## Diagnosis

- Spiral CT Scan
- Lung Scan
- Angiogram
- D-Dimer

## Therapeutic Interventions

- Thrombolytics
- Heparin
- Warfarin (Coumadin)
- Oxygen
- Embolectomy (Rare)
- Jugular or Femoral Filter for Recurrent PE

## Nursing Diagnoses

- Impaired Gas Exchange
- Risk for Injury Related to Anticoagulant Use

## Pulmonary Arterial Hypertension

- Pathophysiology
  - ◆ Elevated Pressure in Pulmonary Arteries
  - ◆ Right Ventricular Failure
- Etiology
  - ◆ Unknown
  - ◆ Secondary – CAD, Valve Disease

## Signs and Symptoms

- Dyspnea
- Fatigue
- Crackles
- Cyanosis
- Tachypnea

## Diagnostic Tests

- ABGs
- Cardiac Catheterization
- ECG
- Additional Tests to Find Cause

## Therapeutic Interventions

- Low Sodium Diet
- Diuretics
- Vasodilators
- Oxygen
- Warfarin

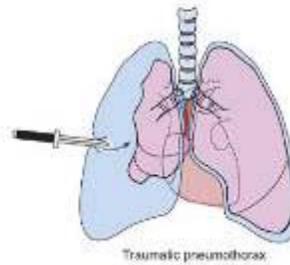
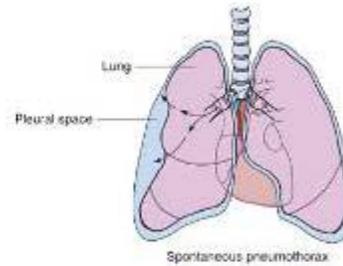
## Nursing Care

- Monitor Respiratory Status
- Bedrest
- Positioning
- Comfort Measures

## Pneumothorax

- Pathophysiology
- Air in the Intrapleural Space
  - ◆ Complete or Partial Collapse of Lung

## Types



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# Signs and Symptoms

- Shallow, Rapid Respirations
- Asymmetrical Chest Expansion
- Dyspnea
- Chest Pain
- Absent Breath Sounds Over Affected Area

# Tension Pneumothorax Signs and Symptoms

- Tracheal Deviation
- Bradycardia
- Cyanosis
- Shock and Death If Untreated

## Diagnostic Tests

- History and Physical Examination
- Chest X-Ray
- ABGs, SaO<sub>2</sub>

## Therapeutic Interventions

- Monitor ABGs and Respiratory Status
- Chest Tube to Water Seal Drainage
- Pleurodesis (Sclerosis) for Recurrent Collapse

## Nursing Care

- Monitor Respiratory Status
- Monitor Chest Drainage System
- Report Changes Promptly

## Rib Fractures

- Etiology
  - ◆ Trauma
  - ◆ Cough
  - ◆ CPR
- Care
  - ◆ Control Pain
  - ◆ Encourage Coughing and Deep Breathing
  - ◆ Promote Adequate Ventilation

## Flail Chest

- Cause
  - ◆ Multiple Rib Fractures
  - ◆ Ribcage Not Able to Maintain Bellows Action
- Care
  - ◆ Monitor ABGs
  - ◆ Mechanical Ventilation

# Nursing Diagnoses: Chest Trauma

- Impaired Gas Exchange
- Ineffective Breathing Pattern
- Acute Pain

# Acute Respiratory Failure

- Pathophysiology
  - ◆ Hypoventilation
  - ◆ Unable to Maintain ABGs

## Etiology

- COPD
- Aspiration
- Neurological Disease

## Signs and Symptoms

- Worsening ABGs
- Increasing Dyspnea
- Restlessness, Confusion
- Lethargy
- Coma and Death

## Diagnostic Tests

- ABGs
  - ◆  $\text{PaO}_2 < 60$  mm Hg
  - ◆  $\text{PaCO}_2 > 50$  mm Hg
- Tests to Determine Cause

## Therapeutic Interventions

- Oxygen
- Bronchodilators
- Correct Underlying Cause
- Intubation and Ventilation
  - ◆ Check Advance Directives

# Acute Respiratory Distress Syndrome (ARDS)

- Pathophysiology
  - ◆ Alveolocapillary Membrane Damage
  - ◆ Pulmonary Edema
  - ◆ Alveolar Collapse
  - ◆ Lungs Stiff and Noncompliant
  - ◆ Lungs May Hemorrhage

## Etiology

- Acute Lung Injury
  - ◆ Sepsis
  - ◆ Shock
  - ◆ Aspiration
- Not Usually in Patients With Chronic Respiratory Disease

## Signs and Symptoms

- Dyspnea
- Elevated RR
- Fine Crackles
- Respiratory Acidosis
- Restlessness, Confusion
- Death Rate 70%

# Diagnostic Tests

- ABGs
- Chest X-Ray
- ECG
- Tests to Determine Cause

## Therapeutic Interventions

- Oxygen
- Intubation
- Mechanical Ventilation
- Treat Underlying Cause
- Supportive Care

## Nursing Diagnoses: Respiratory Failure

- Impaired Gas Exchange
- Ineffective Airway Clearance
- Ineffective Breathing Pattern
- Activity Intolerance
- Anxiety
- Disturbed Thought Processes
- Self-Care Deficit

## Lung Cancer

- Small Cell Lung Cancer
- Large Cell Carcinoma
- Adenocarcinoma
- Squamous Cell Carcinoma

## Etiology

- Smoking
  - ◆ Smokers 13× as Likely to Develop Cancer as Nonsmokers
- Environmental Tobacco Smoke
- Other Carcinogens
  - ◆ Asbestos
  - ◆ Arsenic
  - ◆ Pollution

## Signs and Symptoms

- None Until Late
- Productive Cough
- Recurrent Infection
- Dyspnea
- Hemoptysis
- Anorexia and Weight Loss
- Pain
- Wheezing/Stridor

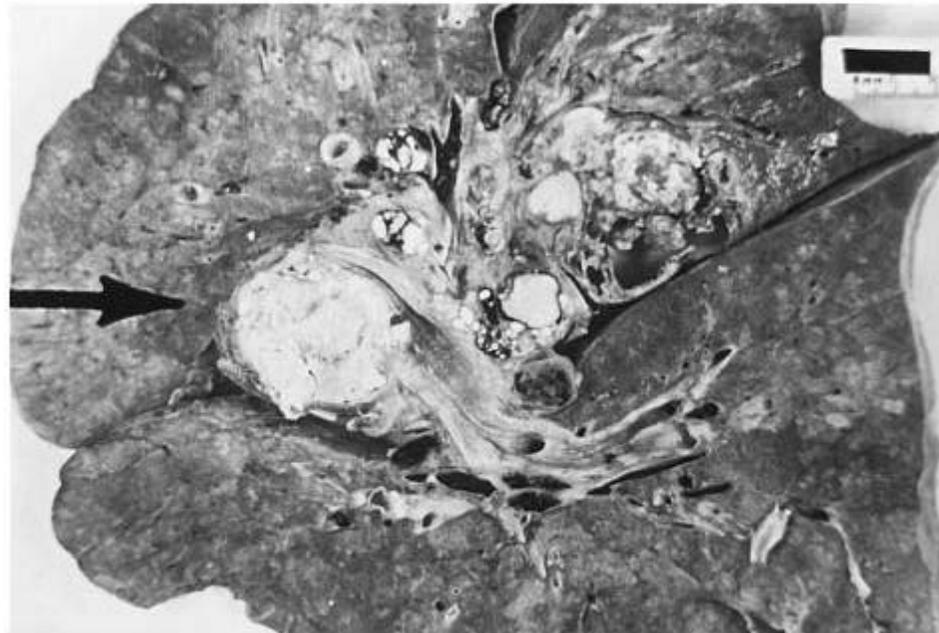
## Complications

- Pleural Effusion
- Superior Vena Cava Syndrome
- Ectopic Hormone Secretion
  - ◆ ADH (SIADH)
  - ◆ ACTH (Cushing's Syndrome)
- Atelectasis
- Metastasis

## Diagnostic Tests

- Chest X-Ray
- CT Scan
- Sputum Analysis
- Biopsy
- Additional Tests to Find Metastasis

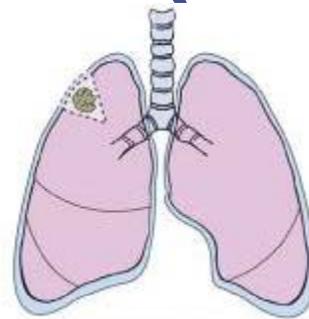
## Lung Cancer



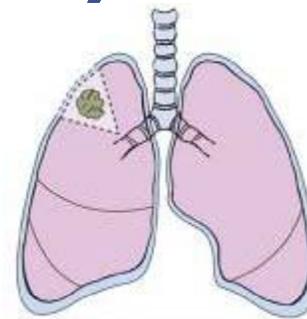
## Therapeutic Interventions

- Stage (TNM System)
- Chemotherapy (Usually Palliative)
- Radiation (Usually Palliative)

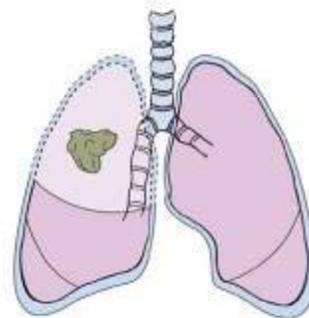
## Therapeutic Interventions (cont'd)



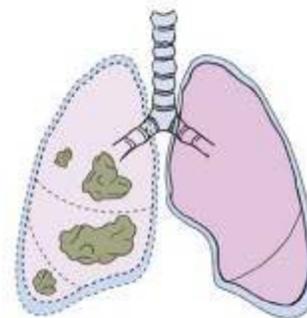
Wedge resection



Segmental resection



Lobectomy



Pneumonectomy

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## Nursing Diagnoses: Lung Cancer

- Impaired Gas Exchange
- Ineffective Airway Clearance
- Imbalanced Nutrition
- Pain
- Constipation
- Anticipatory Grieving
- Activity Intolerance

## Thoracic Surgery

- Pneumonectomy
- Lobectomy
- Resection
- VATS
- Transplant

## Preoperative Care

- Monitor Respiratory Status
- Teach
  - ◆ Routine Preop Teaching
  - ◆ What to Expect
  - ◆ Visit SICU
  - ◆ Include Family

## Postoperative Care

- Intensive Care Setting
- Monitor
  - ◆ Vital Signs
  - ◆ SaO<sub>2</sub>, ABGs
  - ◆ Hemodynamic Parameters
  - ◆ Lung Sounds
- Ventilator
- Chest Tubes

## Nursing Diagnoses

- Ineffective Airway Clearance
- Impaired Gas Exchange
- Acute Pain
- Impaired Physical Mobility
- Risk for Infection