Altered Respiratory Function
Lecture 3

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Rhinitis

- Inflammation of nasal mucosa
  - Due to infection or allergens
- Allergic rhinitis (hayfever)
- Rebound rhinitis
- Viral rhinitis
- Treatment

- Drug therapy
  - Antihistamines
  - Decongestants
  - Antipyretics
  - Antibiotics
- Alternative therapies
  - Examples include?
- Patient education
  - What’s important?
Sinusitis

- Inflammation of mucous membranes of one or more sinuses
  - Obstructs flow of secretions from sinuses
    - Can lead to infection
- Most often in maxillary and frontal sinuses
- Diagnosis – history & manifestations
  - What type of tests?
- Treatment
  - Such as?

- Drug therapy
  - Antibiotics
  - Analgesics
  - Decongestants
Tonsillitis

• Inflammation/infection of tonsils
• S&S
  – Such as?
• Diagnosis
  -What can you do?

• Treatment
  – Antibiotics
  – Surgery may be needed for recurrent infections

• Nursing Priorities
  – Such as?
T & A

• For recurrent acute infections, chronic infections, peritonsillar abscess, or enlarged tonsils or adenoids that obstruct airway

• Postoperatively
  – Assess for airway clearance
  – Provide pain relief
  – Monitor for bleeding
Laryngitis

• Inflammation of mucous membranes lining larynx

• Causes
  – Examples?

• S&S
  – Examples?

• Diagnosis

• -Such as...

• Nursing priorities???
• Treatment???
Influenza

• “Flu” is a highly contagious acute viral respiratory infection.
• Manifestations include what?
• Vaccination: IM or intranasal
• Antivirals help prevent/treat
Pneumonia

Inflammation in interstitial spaces, alveoli, & bronchioles leading to excess fluid in lungs

• Infectious
  – Community acquired
    • Risk factors
  – Hospital acquired (nosocomial)
    • Risk factors
Pneumonia

• Prevention
  – Pneumococcal polysaccharide vaccine
  – Handwashing
  – Avoid large crowds

• Assessment

• Labs/Diagnostics

• Treatment
  – Oxygen
  – Antibiotics
  – Cough / DB q 2hrs, IS
  – Fluids
  – Bronchodilators
  – steroids
Presentation

• Patients may present with
Tuberculosis

• Mycobacterium tuberculosis
  • (How is this determined?)
• Transmitted by aerosolization (airborne)
• Initial infection
  – Middle/lower lobes of lung
  – Local lymph nodes infected & enlarged
• Secondary infection
  – Reactivation of disease in previously infected
• Risk factors
Tuberculosis

A person may contract pulmonary tuberculosis from inhaling droplets from a cough or sneeze by an infected person.

Granuloma in lung tissue

Tuberculosis In The Lung

[Image of a person with a highlighted respiratory system and lung tissue, and X-rays showing tuberculosis in the lung]
Tuberculosis

• Interventions
  – Combination drug therapy (How long?)
  – Patient teaching
  – Multidrug-resistant TB (MDR TB)
Lung Abscess

- Localized area of lung destruction caused by liquefaction necrosis, usually related to pyogenic bacteria
Pulmonary Empyema

- A collection of pus in the pleural space
- Most common cause—pulmonary infection, lung abscess, and infected pleural effusion
Acute Bronchitis

• Infection of lower respiratory tract
• Manifestations
• Treatment
Pulmonary Embolism

• Solids, liquids, or air that lodge in pulmonary vessels
  – Blood clot
  – Fat
  – Tumor cells
  – Foreign objects

• Prevention of PE
  – Aim is to prevent venous stasis and DVT
PULMONARY EMBOLISM
The blood clot from the leg vein travels to the heart and is lodged inside a blood vessel in the lungs, blocking blood supply. This is a potentially fatal emergency.

Heart

Lungs

Blood clot inside a lung blood vessel blocking the blood supply
Pulmonary Embolism

- **Goals of treatment**
  - Increase gas exchange
  - Improve lung perfusion
  - Reduce risk for further clot formation
  - Prevent complications

- **Oxygen therapy**

- Assess patient

- Anticoagulant therapy
Pulmonary Embolus: Laboratory Assessment

- ABGs
- A-a gradient increased
- Pulse oximetry
- Imaging assessment:
  - CXR
  - CT most often to diagnose
Treatment

• Early recognition and treatment is the key to patient survival
• More than half the patients die within the first hour and about 75% die within two hours
• Heparin therapy at high dose levels to prevent the clot from enlarging, and
• Embolectomy-surgically removing the emboli
Acute Respiratory Failure

- A major cause of morbidity and mortality with rates ranging from 50%-70%
- Encompasses many different types of pulmonary disease which have progressed to such a level of severity that the lungs are unable to compensate and function efficiently
Acute Respiratory Failure

• Based on ABG value of PaO$_2$ less than 60 mm Hg, SaO$_2$ less than 90%, or PaCO$_2$ more than 50 mm Hg occurring with pH less than 7.30
• Ventilatory failure, oxygenation failure, or a combination of both ventilatory and oxygenation failure
• The patient is always hypoxemic
Acute Respiratory Failure

• Disease process stems from many major abnormalities
• An inability to get oxygen into the lungs
• Gas exchange issues
• Inadequate blood flow through the pulmonary capillary beds, impairing the oxygen and carbon dioxide exchange process
Acute Respiratory Failure

• Either an oxygen issue or a ventilation issue
• An oxygen issue is defined as a Pa02 value of less than 60 mmHg while obtaining a FiO2 of greater than 50
• A ventilation issue is defined' as a PaCO2 of more than 50 mmHg with a pH less than or equal to 7.25
Treatment- Respiratory Failure

• Treating the underlying cause
• Supporting respiratory effort
• Turn, cough, and deep breathing therapy;
• Suctioning PRN
• Utilization of the incentive spirometer for maintenance of lung expansion
• Vibropercussion utilizing chest physiotherapy (CPT)
Treatment - Respiratory Failure

• Rotation therapy or proning
• Applying oxygen as needed
• Decreasing pulmonary shunting through the use of ventilatory support devices such as:
  – positive end expiratory pressure (PEEP)
  – continuous positive airway pressure (CPAP)
  – bilevel positive airways pressure (BiPAP)
Pharmacological support

- Appropriate antibiotic therapy,
- Bronchodilators and other respiratory medications
- Steroids
- Diuretics
- Electrolyte replacement
Intubation/Ventilation
Preparing for Intubation

• Maintain a patent airway through positioning and the insertion of an oral or nasopharyngeal airway until the patient is intubated
Verifying Tube Placement

• End-tidal carbon dioxide levels
• Chest x-ray
• Assess for breath sounds bilaterally, symmetrical chest movement, and air emerging from the ET tube
Endotracheal Tubes: Nursing Care

- Assess tube placement, minimal cuff leak, breath sounds, chest wall movement
- Prevent movement of tube by patient
- Check pilot balloon
- Soft wrist restraints
- Mechanical sedation
Mechanical Ventilation

• Types of ventilators:
  – Negative-pressure ventilators
  – Positive-pressure ventilators:
    • Pressure-cycled ventilators
    • Time-cycled ventilators
    • Volume-cycled ventilators
Modes of Ventilation

• The ways in which the patient receives breath from the ventilator include:
  – Assist-control ventilation (AC)
  – Synchronized intermittent mandatory ventilation (SIMV)
  – Bi-level positive airway pressure (BiPAP)
  – Other modes of ventilation
Ventilator Controls and Settings

• Tidal volume (Vt)
• Rate—breaths/min
• Fraction of inspired oxygen (FiO₂)
• Peak airway (inspiratory) pressure
• Continuous positive airway pressure (CPAP)
• Positive end-expiratory pressure (PEEP)
• Flow and other settings
Nursing Management

• When caring for a ventilated patient, the nurse should be concerned with the patient first and the ventilator second
• Monitor the patient’s response
• Managing the ventilator system
• Prevent complications
Mechanical Ventilation: Complications

• Cardiac problems:
  – Hypotension
  – Fluid retention
  – Valsalva maneuver
Mechanical Ventilation: Complications (Cont’d)

• GI problems
• Nutritional problems
• Infections—ventilator-associated pneumonia
• Muscle deconditioning
• Ventilator dependence
Lung Problems

- Barotrauma
- Volutrauma
Weaning

• Weaning is the process of going from ventilator dependence to spontaneous breathing
Extubation

• Removal of the endotracheal tube:
  – Hyperoxygenate patient
  – Thoroughly suction ET and oral cavity
  – Rapidly deflate cuff of ET
  – Remove tube at peak inspiration
  – Instruct patient to cough

• Monitoring after extubation is essential
Rib Fracture

• Acute Pain – primary focus
• Breathing adequacy – secondary because they will not breathe correctly if in pain
• Reunite spontaneously
Flail Chest

• Paradoxical chest movement—“sucking inward” of the loose chest area during inspiration and “puffing out” of the same area during expiration
Pediatrics

• Cystic Fibrosis
• Epiglottitis
• RSV
• Mononucleosis
• Pertussis
• Croup
Cystic Fibrosis

• Inherited autosomal-recessive disorder
• Thick mucus production
• Affects multiple systems
  – Gastrointestinal
    • Frothy/foul smelling stools
    • Malnutrition
    • Anemia
    • Thin & underweight
  – Respiratory
    • Wheezes / crackles
    • Diminished breath sounds
    • Frequent pneumonia / bronchitis
  – Integumentary
    • High concentrations of sodium & chloride in sweat
    • Dry & wrinkled
Cystic Fibrosis

• **Diagnosis**
  – Absence of pancreatic enzymes
  – Family history
  – Sweat analysis
  – Chest xray

• **Nursing Care**
  – Ensure respiratory function / prevent infection
  – Enhance nutrition
  – Promote growth & development
  – Parent support systems
Epiglottitis

• A medical emergency
• An illness of croup syndrome
• Signs & symptoms
• Priority treatment
• Corticosteroids
• Antibiotics
• epinephrine
RSV
Respiratory Syncytial Virus

• Acute viral infection involving bronchioles and alveoli
• Seasonal (winter/early spring)
• S & S
RSV

- Diagnosis
- Nursing Care
- Drug therapy
Mononucleosis
“Kissing Disease”

• Epstein-Barr virus
• Communicable during actual phase of illness (7-10 days)
• S & S
• Diagnosis
• Care
Pertussis
“Whooping Cough”

• Highly contagious bacterial infection
  – Spread via droplet and direct contact with discharges

• S & S

• Diagnosis
  – B. pertussis from nasopharyngeal secretions

• Goals of therapy

• Antibiotics
Croup

- A syndrome of illnesses affecting the larynx, trachea, and bronchi
  - Epiglottitis
  - Supraglottitis
  - Laryngitis
  - Laryngotracheobroncholitis
  - Bacterial tracheitis
- 75% are viral (parainfluenza viruses)
- S & S
- Diagnosis based on signs and symptoms
- Treatment
end