Respiratory System Outline - Child

I. Respiratory Infections

A. Infections Spread easily
B. Most often viral causative agent in respiratory infections with children
C. Age factor
D. Diameter of resp tract structures is smaller, distance between structures is shorter thus causing organisms to move more rapidly down resp tract. Shorter Eustachian tubes
E. Signs & Symptoms
   1. Fever
   2. Anorexia
   3. Vomiting, Diarrhea, Abdominal Pain
   4. Nasal Blockage, Rhinitis, Cough
   5. Sore throat

F. Interventions
   1. Humidity
   2. Rest
   3. Tylenol or Ibuprofen
   4. Cool liquids

II. Pharyngitis

A. Infection and inflammation of the throat
B. Viral or bacterial- most common cases are viral
C. Group A- Beta hemolytic streptococcus bacteria most common bacterial cause
   1. Consequences of strep throat=
   2. Clinical manifestations-sore throat, headache, fever, abdominal pain, exudate on tonsils, swollen lymph nodes, painful swallowing
   3. Diagnostics- Throat cultures, rapid antigen swab test
   4. Therapeutic management- Antibiotics PCN or Amoxicillin for 10 days
   5. Nursing considerations-

III. Tonsillitis

A. Infection and inflammation of tonsils
   1. Tonsils are masses of lymphoid tissue in the pharynx

B. Etiology
   1. Often occurs with pharyngitis
C. Clinical manifestations
   1. Enlarged tonsils
   2. Difficulty swallowing and breathing
   3. If adenoids swell – posterior nares become clogged
   4. Offensive mouth odor
   5. Voice nasal and muffled
   6. Fever
   7. Lethargy
D. Therapeutic management
   1. Viral –vs- Bacterial
   2. Diet
   3. Analgesics, Antipyretics, Cool Mist humidifier/vaporizer

4. Surgery
    a. Tonsillectomy-removal of palatine tonsils
    b. Adenoidectomy-removal of adenoids
    c. Risks
        1.) Hemorrhage
        2.) Blood aspiration
    d. Pre-op
        1.) Baseline VS
        2.) Bleeding and clotting times
        3.) Teaching
    e. Post-op
        1.) VS
        2.) Place on side or abdomen until fully awake
        3.) Suction prn but avoid trauma to back of throat
        4.) Discourage purposeful coughing, clearing of throat
        5.) Watch for hemorrhage
        6.) Pain management- ice collar, acetaminophen, ibuprofen prn
        7.) Diet- no spicy foods, no thick liquids, no sticky substances
        8.) Most dangerous time post is 1st 24 hours
        9.) Discharge instructions: No running or vigorous activity for 1-2 weeks. F/U with surgeon for clearance to return to activity.

***** PROCEED TO THE CROUP SYNDROMES HANDOUT NOW ****** for review on:

- Acute Epiglottitis
- Acute Laryngotracheobronchitis
- Acute Spasmodic Laryngitis
- Acute Tracheitis

IV. Bronchiolitis

A. Inflammation and infection of bronchioles
B. Acute viral infection usually caused by RSV, but can be other viruses as well.
C. Etiology
    1. Virus affects the epithelial cells of the respiratory tract
        - Virus replicates in the nasopharynx
        - Spreads to small bronchiolar epithelium lining the small airways within the lungs and a lower respiratory infection begins
        - The lower infection causes edema, increased mucus, eventual necrosis and regeneration of the epithelial cells.
        - This then leads to small airway obstruction, air trapping and increased airway resistance.

D. Transmission
    1. Direct contact with secretion, virus lives on surfaces too
E. Clinical Manifestations
    1. Usually starts as a URI
        a. Rhinorrhea
        b. Low grade fever
        c. Poor feeding
        d. Irritable

e. Cough
f. Then becomes lower respiratory tract infection

F. Diagnostic evaluation- nasal swab to detect RSV, Chest Xray

G. Therapeutic Management
1. High humidity oxygen to keep sats > 90%
2. Fluids, PO or IV
3. Medications
a. Bronchodilators (Albuterol) (Racemic Epi)
b. Corticosteroids (Prednisolone)
c. Antiviral- Ribavirin reserved for high mortality risk patients
4. Hospitalize if complicating condition

H. Synagis (Palivizumab)-preferred method to prevent severe RSV infection
1. Monthly IM injection for high risk infants throughout the RSV season. Monoclonal antibody injection.

I. AAP recommendations
1. Infants born < 29 weeks gestation
2. Infants < 1 year old who have chronic lung disease of prematurity
3. Severe immune deficiencies

J. Nursing Considerations
1. Isolation- droplet, contact and standard precautions
2. Hand washing!

V. <u>ASTHMA</u>

A. Chronic inflammatory disorder of the airways: heightened airway reactivity

B. Inflammation causes wheezing, breathlessness, chest tightness, cough

C. Etiology/ Triggers
- Asthma involves biochemical, immunological, infectious, endocrine, and physiologic factors – all of which cannot be explained

D. Specific Known Triggers
1. Trees, shrubs, grasses, molds, pollens, air pollution spores
2. Tobacco smoke, wood smoke, odors, sprays, dust
3. chemicals
4. Exercise
5. Changes in weather (cold air) or temperature
6. Colds and infections
7. Animal dander
8. Medications: ASA, NSAIDS, antibiotics, beta blockers
9. Foods: Nuts, milk, dairy products

E. Pathophysiology
1. Inflammation increases the airway reactivity
2. Inflammation and edema of mucous membranes
3. Accumulation of secretions from mucus glands
4. Spasms of smooth muscles of the bronchi and bronchioles which decreases their size
5. Narrowing and shortening of the airway which increases airway resistance and decreases airflow

F. Clinical manifestations
1. Cough

2. Respiratory related S&S: SOB, Wheezing, Speaks short, panting, broken phrases
3. Extreme anxiety, fear of suffocation, restless
4. Diaphoresis
5. Increased work of breathing: Edema, mucus plugging, bronchospasm with air trapping

G. Diagnosis/ Evaluation
1. Clinical History, exam
    a. Auscultation
2. X-rays R/O other respiratory illnesses
3. Exercise challenge test
    a. EIB – Exercise Induced bronchospasm
    b. Acute, reversible, usually self-limiting airway obstruction after 5-10 minutes of activity and stops after 20-30 mins
    c. Note: exercise is usually helpful in children with asthma and kids can participate in gym and school activities- sometime need prophylactic treatment before/after activities
4. PFT's
    a. Pulmonary Function tests, evaluates the presence and degree of lung disease

5. PEFR
    a. Measures maximum flow of air that can be forcefully exhaled in 1 second
6. Skin testing
    a. Identifies specific allergens

H. Therapeutic management
1. Based on severity
2. Long term control medications/ prevention
3. Quick relief meds/ rescue meds
4. Metered dose inhaler (MDI)- May have a spacer or reservoir (easier for kids)
5. Corticosteroids- Reverse airflow obstruction
6. NSAIDS
    a. Cromolyn Sodium – neb for maintenance therapy-inhibits airway narrowing
    b. Anti-inflammatory/ anti-allergic
7. B-Adrenergic agonists
    a. Albuterol, levalbuterol, and terbutaline
    b. Bronchodilates, smooth muscle relaxant
    c. Exacerbations and prevention of exercise induced bronchospasm
    d. Inhalant
8. Leukotriene Modifiers – Montelukast sodium (Singulair)
    a. Block inflammatory and bronchospasm effects
    b. Long term control and prevention – give with steroids and beta blockers
    c. Used ages 6 and up

I. Interventions
1. Support: Do not leave the child alone during acute attack
2. Hydration –PO or IV
3. Avoid cool liquids – may induce bronchospasm
4. Small frequent feedings – avoid abdominal distention
5. Position- High fowlers usually preferred
6. Avoid allergens (triggers)

7. Prevention
    a. Breathing exercises to increase expiratory function
    b. Protect from respiratory infections
    c. Flu vaccine
    d. Nebulizers

J. Prognosis
1. Mild to moderate can be controlled
2. Need compliance
3. Chronic uncontrolled may lead to persistent airway inflammation
4. Some "outgrow"- lumen of the airway enlarges and symptoms subside

K. Status Asthmaticus
1. Severe life-threatening asthma exacerbation that is refractory (won't respond) to treatment
2. Treatment
    a. Inhaled short acting beta 2 agonists
    b. Corticosteroids
    c. SQ epi
    d. NPO with IV fluids
    e. Correct dehydration, acidosis, hypoxia, electrolyte imbalances
    f. Humidified oxygen
    g. Antibiotics if infection is also present, ie. pneumonia
    h. No cough suppressants: if they stop coughing then a mucous plug forms

VI. **<u>Cystic Fibrosis-</u>** Generalized dysfunction of exocrine glands that produce mucus
- Autosomal recessive disorder- child inherits defective gene from both parents

A. Etiology
1. Increased viscosity of mucous gland secretions that causes obstructions
2. Increased electrolytes in sweat & saliva
3. Changes in saliva (dry mouth)

B. Clinical Manifestations

<u>Respiratory System</u>
1. Thick pooled bronchial secretions, emphysema
2. Atelectasis, clubbed fingers, distended chests
3. Dry non-productive cough
4. Secondary infections

<u>Gastrointestinal System</u>
1. Decreased enzymes to digest fat, protein, carbs
2. Stools are large, bulky, loose, foul odor- can have rectal prolapse
3. Malnutrition- impaired digestion and absorption of nutrients, can't maintain weight
    1. Deficiency of fat-soluble vitamins
    2. Intestinal obstruction
        a. Meconium ileus

<u>Sweat Glands/ Reproductive System</u>
1. NaCl is 2-5 times elevated
2. Decreased fertility
    -Males
    -Females

3. Higher incidence of diabetes
    - Decreased production of insulin in late stages

C. Diagnostic Criteria
1. S&S
2. Newborn screening, history of affected sibling
3. Sweat test
    1. Apply pilocarpine (cholinergic drug that stimulates sweat gland activity) and place gauze on the skin, electrodes carry a stimulation to the arm or leg to make sweat glands produce sweat, then use filter paper to collect the sweat that forms to have lab analyze it for the sodium and chloride content

D. Therapeutic management

Respiratory

1. Antibiotics
2. Humidified oxygen
3. Aerosol therapy – nebs 3-4 times per day
4. No cough suppressants or codeine
5. THAIRapy vest
6. Huffing forced expiration exercises
7. Lung transplant candidate if long term damage persists

Gastrointestinal

1. High caloric, high protein, moderate fat diet
2. Extra salt in the summer when they lose a lot via sweat
3. Synthetic pancreatic enzymes- taken before/with meals and with snacks. Sprinkle or swallow whole.
4. Multivitamins with the pancreatic enzymes
5. Treat constipation PRN

E. Nursing Interventions
1. Plan of Care
2. Teaching
3. Skin care
4. Home Care
5. Family Support
6. Genetic counseling