

# Respiratory System Outline - Child

## I. Respiratory Infections

- Most often from a viral causative agent in children
- 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 in children.
- Signs & Symptoms- Fever, Anorexia, Vomiting, Diarrhea, Abdominal Pain, Nasal Blockage, Rhinitis, Cough, Sore throat, No appetite
- Interventions- Cool mist humidifier, rest, acetaminophen or Ibuprofen, hydration, fluids

## II. Pharyngitis

- Infection and inflammation of the throat
- Viral or bacterial causes- most common cases are viral
- Group A- Beta hemolytic streptococcus bacteria most common bacterial cause
- Consequences of untreated strep throat= rheumatic fever, glomerulonephritis
- Clinical manifestations- Sore throat, headache, fever, abdominal pain, exudate on tonsils, swollen lymph nodes, painful swallowing
- Diagnostics- Throat cultures, rapid antigen swab test
- Therapeutic management- Antibiotics penicillin or amoxicillin for 10 days & supportive care
- Nursing considerations- rest, hydration, warm saline gargles, acetaminophen/ibuprofen
  1. Considered infectious for up to 24 hours after starting antibiotic therapy

## III. Tonsillitis

- Infection and inflammation of tonsils
- Etiology- often occurs with pharyngitis and can be viral or bacterial cause
- Clinical manifestations- Enlarged tonsils, may have difficulty breathing/swallowing, posterior nares may become blocked causing mouth breathing, mouth odor could occur, muffled voice, cough, fever, lethargy
- Therapeutic management
  1. Viral- symptomatic support -versus- Bacteria which needs antibiotic treatment
  2. Analgesics, Antipyretics, Cool Mist humidifier/vaporizer, surgery
  3. Surgery- Tonsillectomy-removal of palatine tonsils sometimes accompanied by adenoids (adenoidectomy)
    - a. Pre-op Nursing Consideration
      - 1.) Baseline VS
      - 2.) Any bleeding tendencies?
      - 3.) Teaching for what to expect post care
    - b. Post-op
      - 1.) VS
      - 2.) Positioning
      - 3.) If suctioning is needed avoid back of throat trauma
      - 4.) Discourage purposeful coughing, clearing of throat
      - 5.) Watch for hemorrhage
      - 6.) Pain management- ice collar, acetaminophen, ibuprofen prn
      - 7.) Diet- easy foods to swallow, bland
      - 8.) Discharge instructions: F/U with surgeon for clearance to activity.

## IV. Acute Otitis Media

- Inflammation of the middle ear space with rapid onset of signs/symptoms of acute infection
- Usually preceded by a URI or otitis media that harbors bacteria which colonized
- Most common bacterial causes

- S/S- pain, fever, discharge, pulling at the ear, loss of appetite, irritability, hearing loss, vertigo
- Dx- Bulging/red tympanic membranes, symptoms, correlation to previous URI?
- Treatment- Antibiotics (Amoxicillin), antipyretics, oral hydration, analgesics
- Myringotomy/Tympanostomy
  1. Myringotomy to drain infected fluid from ear
  2. Tympanostomy (tubes) to allow continued drainage and equalize pressure in middle ear
  3. Teach that tubes will fall out months after insertion (8-18 mths typical)
  4. Call doctor for any acute pain/fever/purulent drainage

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

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

## V. Bronchiolitis

- Inflammation and infection of bronchioles
- Acute viral infection usually caused by RSV (respiratory syncytial virus)
- Etiology
  1. Virus affects the epithelial cells of the respiratory tract. Virus replicates in the nasopharynx then spreads to small bronchiolar epithelium lining the small airways within the lungs and a lower respiratory infection begins
  2. The lower infection causes edema, increased mucus, eventual necrosis, and regeneration of the epithelial cells. This leads to small airway obstruction, air trapping and resistance.
- Transmission- Direct contact with infected secretions, virus lives on surfaces too
- Clinical Manifestations- URI, rhinorrhea, low grade fever, poor feeding, irritable, cough
- Diagnostic evaluation- RSV nasal swab, Chest Xray
- Therapeutic Management- High humidity oxygen to keep sats > 90%, Fluids, PO or IV
  1. Medications
    - a. Bronchodilators (Albuterol) (Racemic Epi)
    - b. Corticosteroids (Prednisolone)
    - c. Antiviral- Ribavirin reserved for high mortality risk patients
    - d. Synagis (Palivizumab)-preferred method to prevent severe RSV infection. Monthly IM injection for high-risk infants throughout the RSV season. Monoclonal antibody injection.
- AAP recommendations for Synagis (Palivizumab)
  1. Infants born < 29 weeks gestation
  2. Infants < 1 year old who have chronic lung disease of prematurity
  3. Severe immune deficiencies
- Nursing Considerations
  1. Isolation- droplet, contact and standard precautions
  2. Hand washing is a must! Highly contagious

## VI. ASTHMA

- Chronic inflammatory disorder of the airways: heightened airway reactivity. Inflammation causes wheezing, breathlessness, chest tightness, cough
- Genetic predisposition for development of an IgE response to allergens is common
- Etiology/ Triggers- biochemical, immunological, infectious, endocrine, and physiologic factors
- Specific Known Triggers
  1. Environmental

2. Chemicals
  3. Exercise
  4. Changes in weather
  5. Colds and infections
  6. Medications: ASA, NSAIDS, antibiotics, beta blockers
  7. Foods: Nuts, milk, dairy products
- Pathophysiology
    1. Inflammatory response to some sort of stimuli/trigger
    2. Airway edema results
    3. Accumulation and secretions from mucus glands occurs
    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
  - Clinical manifestations
    1. Cough, SOB, wheezing, speaks in short, panting, broken phrases, extreme anxiety, fear of suffocation, restless, diaphoresis, increased work of breathing, bronchospasm
  - Diagnosis/ Evaluation- Clinical History, auscultation of lungs, X-rays R/O other respiratory illnesses, exercise challenge test
    1. Exercise Challenge Test- looking for exercise induced bronchospasm
    2. Acute, reversible, usually self-limiting airway obstruction after 5-10 minutes of activity and stops after 20-30 mins
    3. Exercise is usually helpful in children with asthma and kids can participate in gym and school activities
    4. PFT's- Pulmonary Function tests
    5. PEFR- Peak Expiratory Flow Meter- measures maximum flow of air that can be forcefully exhaled in 1 second
    6. Skin testing- Identifies specific allergens
  - Therapeutic management- long term control medications/ prevention. Quick relief meds/rescue meds
    1. Metered dose inhaler (MDI)- May have a spacer
    2. Corticosteroids- Reverse airflow obstruction
    3. NSAIDs-Cromolyn Sodium – neb for maintenance therapy-inhibits airway narrowing. Used for anti-inflammatory/ anti-allergic
    4. B-Adrenergic agonists- Albuterol, levalbuterol, and terbutaline- Bronchodilates, smooth muscle relaxant. Used for exacerbations and prevention of exercise induced bronchospasm
    5. Leukotriene Modifiers – Montelukast sodium (Singulair). Block inflammatory and bronchospasm effects. Long term control and prevention – give with steroids and beta blockers
      - a. Used ages 6 and up
    6. Anticholinergics- Ipratropium (Atrovent)- Bronchodilates, reduce bronchospasm
  - Interventions
    1. Support: Do not leave the child alone during acute asthma attack
    2. Position- High fowlers usually preferred
    3. Avoid allergens (triggers), teach to track & identify triggers
    4. Prevention
      - a. Breathing exercises to increase expiratory function
      - b. Protect from respiratory infections (Flu vaccine)
      - c. Nebulizers

- Prognosis- Mild to moderate asthma can be controlled but need medication compliance
- Status Asthmaticus- Severe life-threatening asthma exacerbation that is refractory (won't respond) to treatment
  1. Treatment
    - a. Inhaled short acting beta 2 agonists, corticosteroids, anticholinergics
    - b. IV fluid support prn
    - c. Humidified oxygen
    - d. Antibiotics if infection is also present, ie. pneumonia

**VII. Cystic Fibrosis**- Generalized dysfunction of exocrine glands that produce mucus. An autosomal recessive disorder- child inherits defective gene from both parents

- Etiology
  1. Increased viscosity of mucous gland secretions that causes obstructions
  2. Increased electrolytes in sweat & saliva (sodium and chloride)
  3. Changes in saliva (dry mouth)
  4. Changes in the autonomic nervous system
- Clinical Manifestations
  1. Respiratory System- Thick pooled bronchial secretions, emphysema, atelectasis, clubbed fingers, distended chests, dry non-productive cough, secondary infections
  2. Gastrointestinal System- Decreased enzymes to digest fat, protein, carbs, stools are large, bulky, loose, foul odor, malnutrition, weight loss/poor weight gain, deficiency of fat-soluble vitamins
  3. Sweat Glands/ Reproductive System- NaCl is 2-5 times elevated, decreased fertility
  4. Endocrine- Decreased production of insulin in late stages, risk of diabetes higher
- Diagnostic Criteria- S&S, Newborn screening, history of affected sibling, Positive sweat test
  1. Sweat test
- Therapeutic management
  1. Respiratory- Aerosol therapy – neb treatments, nebulized saline, postural drainage, flutter mucus clearing device, Antibiotics prn, Huffing forced expiration exercises
  2. Gastrointestinal- High calorie, high protein, moderate fat diet. Extra salt in the summer months. Synthetic pancreatic enzymes- taken before/with meals and with snacks and sprinkle on foods or swallow the enzymes whole. Multivitamins with the pancreatic enzymes. Treat constipation PRN

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