General Aspects of Respiratory Infections

- Respiratory infections account for the majority of acute illnesses in children
- Infectious agents: respiratory syncytial virus (RSV), pneumococci, mycoplasma
- Age (6 months -3 years of age are at risk)
- Anatomy of the child’s respiratory tract place them more at risk
- Resistance: malnutrition, anemia, fatigue, allergies, second hand smoke
- Seasonal variations
Signs and Symptoms of Respiratory Infections

- Fever
- Meningismus
- Anorexia
- Vomiting
- Diarrhea
- Abdominal pain
- Nasal blockage
- Cough
- Respiratory sounds
- Sore throat
- Nasal discharge

Nursing Care Management

- Assess respiratory function: rate, depth, ease, labored breathing, rhythm, evidence of infection, cough, wheeze, cyanosis, chest pain, sputum, halitosis
- Plan of care: ease respiratory efforts, promote rest, promote comfort, prevent spread of infection, reduce temperature, promote hydration, provide nutrition, support family

Evaluation

Upper Respiratory Tract Infections

- Nasopharyngitis
- Pharyngitis
- Tonsillitis
- Infectious mononucleosis
- Influenza
- Otitis media
Nasopharyngitis
- Is caused by any of a number of different viruses (rhinoviruses, RSV, adenovirus) and are more severe in infants/children
- Treated at home/rest
- Antipyretics
- Decongestants/antihistamines
- Cough suppressants that don’t contain alcohol

Nursing Care Of The Child With Nasopharyngitis
- Elevate the head of the bed/crib mattress
- Remove secretions (bulb syringe)
- Prevent dehydration
- Prevent transmission of virus/bacterium
- Family support

Pharyngitis
- Group A B-hemolytic streptococci (strep-throat) place the child at risk for acute rheumatic fever, acute glomerulonephritis)
- Usually a brief illness
- S/S: pharyngitis, headache, fever, abdominal pain, inflammation of tonsils and pharynx
- Anterior cervical lymphadenopathy
Pharyngitis Continued

- Throat culture
- Penicillin, erythromycin, amoxicillin, penicillin+rifampin
- Nursing Care: throat swab for culture, cool/warm compresses to the neck, saline gargles, liquids, antibiotic therapy

Tonsillitis

- Tonsils are masses of lymphoid tissue located in the pharyngeal cavity. They filter and protect the respiratory and alimentary tracts from invasion of pathogenic organisms
- Waldeyer tonsillar ring, faucial, pharyngeal (adenoids), lingual, tubal
- Tonsilitis is a common cause of morbidity in young children
Therapeutic Management of Tonsillitis

- Tonsillitis is self-limiting, therefore treatment is symptomatic
- Antibiotics
- Tonsillectomy (removal of palatine tonsils)
- Adenoidectomy
- Contraindications to tonsillectomy/adenoidectomy: cleft palate, acute infections at the time of surgery, uncontrolled systemic diseases
**Nursing Care Management Of Tonsillitis**

Post tonsillectomy
- Provide comfort measures (mist vaporizer, ice collar, tetracaine lollipops, soft diet)
- Minimize activities that precipitate bleeding (frequent coughing/clearing the throat, frequent suctioning)
- Place child on abdomen to facilitate drainage of secretions
- S/S hemorrhage: tachycardia, hematemesis, frequent swallowing

**Infectious Mononucleosis**
- Is an acute self-limiting infectious disease
- Common among young people under 25 years of age
- Epstein-Barr virus, spot test
- Mildly contagious via direct contact with oral secretions
- No specific treatment
- Bed rest/ regulate activity

**Influenza**
- Caused by different viruses
- Spread from direct contact
- Symptomology most severe in infants
- Common in winter months
- Has a 1-3 day incubation period and affected persons are most infectious for 24 hours before the onset of symptoms
- Symptomatic treatment (Tylenol not ASA)
- Inactivated influenza viral vaccines
Otitis Media

- Inflammation of middle ear
- Incidence is highest in children 6 months to 2 years
- Highest prevalence in the winter months
- Commonly caused by Streptococcus pneumoniae and Haemophilus influenzae
- Non-infectious type caused by blocked eustachian tubes from the edema of URI, allergic rhinitis, hypertrophic adenoids
  - Second hand smoke
Otitis Media Continued

- Infants fed breast milk have a lower incidence of otitis media
- Avoid supine position during feeding
- Impaired drainage causes retention of secretions in the middle ear
- Diagnostics: otoscopy reveals a bright red and bulging membrane and meniscus, tympanometry, culture, hearing evaluation

Clinical Manifestations of Otitis Media

- Acute otitis media: follows an upper respiratory infection, earache (otalgia), fever, otorrhea (purulent discharge)

Management of Otitis Media

- Penicillin
- Myringotomy: surgical incision of the eardrum
- Tympanostomy tubes (pressure equalizer)
- Nursing Care: relieve pain, facilitate drainage, prevent complications
- Education: Avoid swimming in lakes, heating pad to affected ear, upright position during feedings, grommet
Croup Syndromes

- Acute epiglottitis
- Acute laryngitis
- Acute spasmodic laryngitis
- Bacterial tracheitis

Acute Epiglottitis

- Is a serious obstructive inflammatory process that occurs in children between 2-5 years of age
- Haemophilus influenzae
- Clinical manifestations: tripod position, irritable, substernal retractions, cyanosis, epiglottis is cherry red and edematous, respiratory obstruction causing loss of consciousness

Acute Epiglottitis

- Inspect the throat only when intubation can be performed
- Intubation, blood gases, pulse oximetry
- Tracheostomy
- Intravenous fluids
- Corticosteroids for reducing edema
- Antibiotics
Acute Laryngitis

- Common in older children and adolescents
- S/S: sore throat, nasal congestion, fever, headache, myalgia, malaise
- The disease is almost always self-limited
- Treatment is symptomatic with fluids and humidified air

Acute Laryngotracheobronchitis

- Is an inflammation of the mucosa lining the larynx and trachea causing a narrowing of the airway
- Affects children less than 5 years of age
- Parainfluenza virus (RSV), influenza A and B, Mycoplasma pneumoniae

Progression of Symptoms in Laryngotracheobronchitis

- Stage I
- Stage II
- Stage III
- Stage IV
Management of LTB

• Maintain an airway
• High humidity with cool mist
• Racemic epinephrine: cause mucosal vasoconstriction that decreases subglottic edema, onset of action is rapid
• Corticosteroids
• Comfort measures
  • Drinking fluids except when respirations are greater than 60 breaths/min

Management of LTB Continued

• ABG’s
• Intubation: increased pulse and respiratory rate, retractions, flaring nares, increased restlessness
• Promote rest
• Psychological support

Acute Spasmodic Laryngitis

• Known as midnight croup
Bacterial Tracheitis

- Is an infection of the mucosa of the upper trachea seen in children ages 1 month to 6 years of age and is a complication of LTB
- Previous history of URI with croupy cough, stridor, toxicity and high fever
- Thick, purulent tracheal secretions

Infections Of The Lower Airways

- Bronchitis
- Respiratory Syncytial Virus (RSV) or Bronchiolitis
- Pneumonias

RSV/Bronchiolitis

- Inflammation of the bronchial mucosa where the lumina is filled with mucus and exudate.
- Air is trapped and atelectasis occurs
- Infections occur in winter and spring and affect children under 2 years of age
- RSV causes half of all pediatric hospitalizations for bronchiolitis
RSV/Bronchiolitis
Continued

- Diagnostics: History (URI, otitis media, respiratory distress, apnea), x-ray showing consolidation, presence of hypercapnia, ELISA, rapid immunofluorescent antibody
- Infection control measures
- Intravenous fluids, corticosteroids, theophylline
- Mist therapy
- RSV immune globulin, Monoclonal antibody

Signs and Symptoms of Respiratory Syncytial Virus

- Initial:
- Progression of illness:
- Severe

Pneumonia

- Is an inflammation of the pulmonary parenchyma
- Lobar pneumonia: most of the pulmonary lobes are involved
- Bronchopneumonia: exudate in the terminal bronchioles
- Interstitial pneumonia: inflammation is confined to the alveolar walls
Viral Pneumonia

- Occur more commonly than bacterial pneumonias
- RSV accounts for the largest percentage
- The child is more susceptible to secondary bacterial invasion
- Treatment is symptomatic (cool mist, chest physiotherapy, postural drainage)

Primary Atypical Pneumonia

- Mycoplasma pneumoniae is the most common cause of pneumonia in children between ages 5-12 years of age
- Most people recover from this acute illness in 7-10 days
- Hospitalization is rarely necessary

Bacterial Pneumonia

- Onset is abrupt usually preceded by a viral infection
- Antibiotic therapy, bed rest, antipyretic
- Hospitalization
Nursing Care

- Supportive and symptomatic
- Possible isolation procedures
- Mist tent with or without oxygen
- Vital signs
- Respiratory assessment
- Psychological support

Other Infections Of The Respiratory Tract

- Pertussis (whooping cough)
- Tuberculosis

Pertussis

- Is an acute respiratory infection caused by Bordetella pertussis that occurs chiefly in children younger than 4 years of age and who have not been immunized
- Highly contagious
- Incidence is highest in spring and summer months
Tuberculosis

*Mycobacterium tuberculosis*

- May affect bone, meninges, lymph nodes, lungs
- Diagnostics: TB skin test, x-ray, culture

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**TB Testing**

Recommended procedure is Mantoux test
Uses purified protein derivative (PPD)
Standard dose and administration technique

Positive reaction
- ≥ 5-mm induration
- ≥10-mm induration
- ≥15-mm induration

Recommendations for TB testing

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*Tuberculoma*
Blew and Garabach, 2000/courtesy Dr. Carl Halleon, New England Medical Center, Boston
TB Continued

- Manifestations

- Drug therapy: isoniazid (INH), rifampin, pyrazinamide (PZA) for 6 months to 1 year

- Prevention: optimal state of health

Nursing Care Of The TB Patient

- Isolation precautions
- Obtaining sputum specimens
- Gastric washing for the very young to obtain material for a smear
- Direct observed therapy (medications)

Pulmonary Dysfunction Caused By Noninfectious Irritants

- Foreign body aspiration
- Aspiration pneumonia
- Acute respiratory distress syndrome
- Inhalation injury
- Passive smoking
Foreign Body Aspiration

- Common in children under 3 years of age because they explore things with their mouths
- Problem foods: hot dog, round candy, peanuts, cookie, biscuit, peanut butter
- Partial airway/full airway obstruction
- Bronchi obstruction: cough, wheezing, dyspnea
- Larynx obstruction: inability to speak

Foreign Body Aspiration

Continued

- X-ray
- Bronchoscopy
- CPR: back blows, abdominal thrusts, chest thrusts, Heimlich maneuver
- After removal of the FB, place the child in a high humidity atmosphere
- Prevention
- Child in distress: cyanosis, collapse, cannot speak

Aspiration Pneumonia

- Aspiration pneumonia is a hazard for the child who has problems swallowing from paralysis, weakness, absent cough reflex
Acute Respiratory Distress Syndrome

- Is a syndrome characterized by respiratory distress and hypoxemia that occurs within 72 hours of a serious injury or surgery in a person with previously normal lungs.

Nursing Care of ARDS

- Monitoring cardiac output
- Heart rate
- Perfusion
- Capillary filling
- Urine output
- Assess respiratory status
- Blood gases
- Psychological support

Inhalation Injury: Smoke and Carbon Dioxide

- Injury depends on the inhaled substance and the length of time of exposure.
- Local injury: soot material around the nose, singed nasal hairs, stridor.
- CAUTION: Oxygen saturation will be normal.
**Manifestations of CO poisoning**

- Headache
- Visual disturbances
- Irritability
- Nausea
- Confusion
- Hallucinations
- Coma
- Cyanosis

**Management of Inhalation Injury**

- Humidified 100% oxygen
- Baseline ABG
- Tracheostomy
- Intubation

**Passive Smoking**

- Causes an increased number of respiratory illnesses in children including asthmatic attacks
- Smoking during pregnancy: bronchitis, asthma, otitis media, decreased fetal growth, increased stillbirths, preterm deliveries, SIDS
- Education: hazards of smoking
Long Term Respiratory Dysfunction

- Asthma
- Cystic fibrosis

Asthma

- Is a chronic inflammatory disorder of the airways that occurs between 3-8 years old

- Characterized by wheezing, breathlessness, chest tightness, cough

![Mechanisms of obstruction in asthma](image.png)
Triggers Which Precipitate Asthmatic Exacerbations

- Allergens
- Exercise
- Cold air
- Changes in weather
- Infections
- Animals
- Food Additives
- Medications
- Strong emotions
- GERD
- Foods like nuts, milk
- Endocrine factors like menses, pregnancy

Diagnostic Evaluation Of Asthma

- Physical examination
- X-ray
- Pulmonary function tests (PFT)
- Spirometry
- Peak expiratory flow rate/meter
- Skin testing
- Provocative testing
- Radioallergosorbent test

Therapeutic Management Of Asthma

- Allergen control
- Drug therapyLeukotriene modifiers
- Exercise induced bronchospasm
- Chest physiotherapy
- Hyposensitization
- Exercise induced asthma
Medications Prescribed For Asthma

- Medications are divided into two classes: long term control medications and rescue medications
- Corticosteroids
- Cromolyn sodium
- B-Adrenergic agonists
- Theophylline
- Leukotriene modifiers

Status Asthmaticus

- Is a medical emergency that can result in respiratory failure
- Profuse sweating, remains sitting upright
- Humidified oxygen
- Intravenous therapy
- Albuterol, blood gases
- Subcutaneous epinephrine
Nursing Care Of The Asthmatic Child

- Avoid known allergens
- Relieve bronchospasm: many children can recognize early signs of an impending attack
- Objective signs
- Education
- Infection control
- Avoid allergenic foods

Cystic Fibrosis

- CF is an inherited condition where chromosome 7 has mutated.
- Clinical features: increased viscosity of mucous gland secretions, elevation of sweat electrolytes, increased enzymes in saliva, abnormal nervous system function, meconium ileus, prolapse of the rectum, pancreatic fibrosis, pulmonary complications, steatorrhea
Diagnostic Evaluation Of Cystic Fibrosis

- A history of the disease in the family
- Absence of pancreatic enzymes
- Increase in electrolyte concentration of sweat (sodium and chloride)
- Chronic pulmonary involvement
- Sweat chloride test (>60 Meq/L)
- Chest x-ray: patch atelectasis, obstructive emphysema
- 72 hour stool analysis

Therapeutic Management Of Pulmonary Problems (CF)

- Goals: prevent pulmonary infection, remove mucopurulent secretions, administer antimicrobial agents
- Chest physiotherapy BID using a flutter mucus clearance device
- Bronchodilator medication prior to CPT
- Pulmozyme (decreases viscosity)
- IV antibiotics
- Judicial use of oxygen due to CO2 retention (oxygen narcosis)
Therapeutic Management of Gastrointestinal Problems (CF)

These children have pancreatic insufficiency with impaired intestinal absorption
- Pancreatic enzymes with each meal
- High protein/high calorie diet
- Water-miscible forms of vitamins (ADEK)
- Supplemental feedings

Presentation
- Wheezing respiration, dry nonproductive cough
- Generalized obstructive emphysema
- Patchy atelectasis
- Cyanosis
- Clubbing of fingers and toes
- Repeated bronchitis and pneumonia
Nursing Care Of The Child With Cystic Fibrosis

Assessment:
- Respiratory
- GI
- Family support
- Education
- Evaluation

Prognosis of CF
- Estimated life expectancy for child born with CF in 2003 is 40 to 50 years
- Maximize health potential
  - Nutrition
  - Prevention/early aggressive treatment of infection
  - Pulmonary hygiene
- New research—hope for the future
  - Gene therapy
  - Bilateral lung transplants
  - Improved pharmacologic agents

The Plan of Care and Education
- Frequent skin care to prevent skin breakdown over bony prominences
- Diet: extra fluids to prevent dehydration, high fat/high calorie, don't restrict salt
- Medications
- CPT, postural drainage and breathing exercises
- Yearly pneumococcus/influenza vaccine
- Referral to The Cystic Fibrosis Foundation
- Anticipatory grieving
Respiratory Emergency

1. Respiratory insufficiency:
   A. Inability to maintain normal blood gases
   B. Increased work of breathing with adequate gas exchange

2. Respiratory failure: inability to oxygenate the blood

3. Respiratory arrest: cessation of breathing

4. Apnea: absence of air flow

5. CPR

Clinical Manifestations of Respiratory Failure

- Cardinal Signs: restlessness, tachypnea, tachycardia, diaphoresis
- Early signs: mood changes, headache, hypertension, anorexia, increased cardiac output, flaring nares, chest wall retractions, grunt, wheezing
- Severe hypoxia: hypotension/hypertension, stupor, coma, dyspnea, bradycardia, cyanosis

Recovery Position

[Image of recovery position]