Pediatric Respiratory Disorders

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Describing the differences between adult and pedi client

- Differences between the very young child and the older child
- Resistance can depend on many factors
- Clinical manifestations: those from 6 months to 3 years of age react more severely to acute resp tract infections
Differences in Adult and Child

**Adult**

- Smaller nasopharynx, easily occluded during infection.
- Lymph tissue (tonsils, adenoids) grows rapidly in early childhood; atrophies after age 12.
- Smaller nares, easily occluded.
- Small oral cavity and large tongue increase risk of obstruction.
- Long, floppy epiglottis vulnerable to swelling with resulting obstruction.
- Larynx and glottis are higher in neck, increasing risk of aspiration.
- Because thyroid, cricoid, and tracheal cartilages are immature, they may easily collapse when neck is flexed.
- Because fewer muscles are functional in airway, it is less able to compensate for edema, spasm, and trauma.
- The large amounts of soft tissue and loosely anchored mucous membranes lining the airway increase risk of edema and obstruction.

**Child**
A diagnosis of OM requires all of the following:

- Recent, usually abrupt onset of illness
- The presence of middle ear fluid, or “effusion” (OME)
- Signs or symptoms of middle ear inflammation

OME: hearing loss, tinnitus, vertigo

Differences between young and older child OM:

- Young child (infants) fussy, pulls at ear, anorexia, crying, rolling head from side to side
- Older child crying, verbalizes discomfort
Understanding OM

Middle ear space filled with cholesteatoma, middle ear bones eroded

Retracted and perforated

Eustachian tube Blocked by inflammatory tissue
Otitis media (OM)

Note the ear on the left with clear tympanic membrane (drum); ear on the right, the drum is bulging and filled with pus.
Acute Otitis Media
characterized by abrupt onset, pain, middle ear effusion, and inflammation.

Note the injected vessels and altered shape of cone of light.
Evaluation and therapy

- Tx has always been directed toward abx; however, recently concerns about drug-resistant *streptococcus pneumoniae* have caused medical professionals to re-evaluate therapy (APA, 2004)
- No clear evidence that abx improve OM
- Waiting up to 72 hrs for spontaneous resolution is now recommended in healthy infants
- When abx warranted, oral amoxicillin in high dosage TOC
Nursing Care Management for OM

- Nursing objectives:
  - Relieving pain
  - Facilitating drainage when possible
  - Preventing complications or recurrence
  - Educating the family in care of the child
  - Providing emotional support to the child and family
Preparing the child for surgery
A myringotomy or pin hole is made in the ear drum to allow fluid removal. Air can now enter the middle ear through the ear drum, by-passing the Eustachian tube. The myringotomy tube prevents the pin hole from closing over. With the tubes in place, hearing should be normal and ear infections should be greatly reduced.
Tonsillitis
Causative agents for tonsillitis

- May be bacterial or viral
- Most common bacterial agent: *Group A beta-hemolytic strep*
- Throat cultures must be done to determine origin
- Older child may develop peritonsillar abscess
Treatment for tonsillitis

- Treatment is symptomatic
- Antibiotics restricted to those with bacterial infection
- Drug of choice: amoxicillin
- Surgery (with recurrent infections)
Nurse Alert!

The nurse should remind the child with a positive throat culture for strep to discard their toothbrush and replace it with a new one after they have been taking antibiotics for 24 hours.
Nursing Care for the Tonsillectomy and Adenoidectomy Patient

Why is collection of blood for assessment of bleeding and clotting times so important?
Nursing Care for the Tonsillectomy and Adenoidectomy Patient

- Pre-operative preparation

- Providing comfort and minimizing activities or interventions that precipitate bleeding
  - Place on abd until fully awake
  - Manage airway
  - Monitor bleeding, esp. new bleeding
  - Ice collar, pain meds
  - Avoiding po fluids until fully awake..then liquids, soft
  - Post-op hemorrhage can occur
Nurse Alert for Post-Op T/A surgery

- Most obvious sign of early bleeding is the child’s continuous swallowing of trickling blood.
  
  While the child is sleeping, note the frequency of swallowing and notify the surgeon immediately.
Discharge teaching

- Monitor child at home for:
  - Excessive swallowing
  - Signs of fresh bleeding
  - Vomiting bright red blood
  - Restlessness not associated with pain
  - Keep child quiet for 1 wk after surgery
  - Avoid red liquids (might appear as blood)
  - Do not allow straws!
  - Discourage from coughing
  - Awareness of “scab” in 7-10 days
Apnea

- Defined as delay of breathing over 20 seconds
- Manifestations
- Diagnostic tests
- Therapeutic Interventions and Nursing Care
Categories of apnea

- Prematurity: most common and may vary among neonates

- Infant apnea: no known cause; r/o seizures, GERD, hypoglycemia
Apnea vs Periodic Breathing

- **Apnea:**
  - Cessation > 20 seconds
  - S/S to assess:
    - Cyanosis
    - Marked pallor
    - Hypotonia
    - Bradycardia

- **Periodic breathing**
  - Normal breathing pattern of NB but never > 10-15 seconds
  - Even though normal, all parents are taught CPR for their NB
Diagnostics for apneic episodes

- Pneumocardiography
- CXR
- Blood chemistry studies
- ECG
- EEG
Nursing responsibilities in caring for an infant with apnea

- Nurse sets parameters for HR according to age
- Gentle stimulation of infant
- Maintaining a neutral environment
- Instruct family with apnea monitors at home
Instructions to families with apnea monitors at home

- Must know CPR!
- 24 hr coverage is available for emergencies
- Parents should maintain a diary of episodes
- Have them verbalize their fears associated with the apnea
SIDS

- Defined: sudden death of an infant **during sleep**
- Etiology
- Assessment
- Therapeutic Interventions and Nursing Care
Risk factors for SIDS

- No single cause has been identified
- Most common causes noted:
  - Prematurity
  - Brainstem defects
  - Infections
  - Genetic predisposition
  - Lower socioeconomic status, cultural influences
  - Smoking during pregnancy and exposing the infant to smoke,
  - Environmental stress (prone position)
Nursing Interventions for SIDS

- Provide calm and compassionate support
- Conduct interview in a calm, slow and non-threatening way
- Infant should be cleaned, swaddled and presented to parents after death declared
- Refer to local SIDS program
- SIDS link: [www.sids.org](http://www.sids.org)
Croup vs. Epiglottitis

**Croup**
- Usual age range: 1-3 yrs
- Inspiratory stridor
- Harsh cough (barking)
- Viral infection; afebrile
- Gradual onset, usually at night
- Improved with humidity; may need racemic epi
- Treatable at home
- Resolves spontaneously

**Epiglottitis**
- Usual age range 3-7 yrs
- May have stridor
- Caused by \*\*H.influenzae, but may staph and strep as well
- Sudden onset
- Sore throat and difficulty swallowing
- May be an emergent situation
- Lateral soft tissue of neck xray
- Have equipment at bedside
Cardinal signs of epiglottitis

- Drooling
- Dysphagia
- Dysphonia
- Distressed inspiratory efforts
Nursing care for the child with epiglottitis

- Observe for symptoms of respiratory distress
- Assess respiratory rates: >60
- Elevated temp > 101°
- The child must NEVER be left alone
- NOTHING should be placed in the mouth (laryngeal spasms could result)
Medications for croup and epiglottitis

- **Croup**
  - Racemic epi nebulization
  - Oral dexamethosone in a single dose
  - Acetaminophen
  - Humidified O2 and IVs for more severe cases
  - Sedatives are contraindicated

- **Epiglottitis**
  - Child kept NPO
  - IV antibiotics
  - Antipyretics for fever
  - Emergency hospitalization
Bronchitis vs Bronchiolitis

In bronchiolitis, the airway becomes obstructed from swelling of the bronchiole walls.
The diameter of an infant’s airway is approximately 4 mm, in contrast to an adult’s airway diameter of 20 mm.
Bronchitis

- **Etiology**
  - Inflammation of trachea and major bronchi
  - Usually viral (Rhino and RSV)
  - Occur with other conditions; may be confused with RAD (asthma)
  - Cough major symptom
  - Gradual onset of rhinitis
  - Productive cough (may be purulent) with ↑ mucus
  - Crackles, rhonchi
Nursing considerations for a child with bronchitis

- Increase fluids
- Assess VS, secretions, respiratory effort
- S/S sleep deprivation from cough
- Antipyretics for fever
- Quiet activities for diversion
Bronchiolitis

- **Etiology**
  - RSV most common pathogen
  - May acquire from older siblings
  - Peak incidence @ 6 months
  - Mild upper respiratory incident precedes
  - Hyperinflation of the lungs on xray
Management of bronchiolitis

- If mild, treated at home
- Humified O2 if hospitalized
- HOB elevated
- Abx not given unless secondary bacterial infection
- RSV prevention most important
Preventive measures against RSV

- Follow droplet and contact precautions (can live on inanimate objects)
- Nosocomial infections very common; strict hand hygiene must be observed
- Synagis (palivizumab) given IM only to at risk children
Reactive Airway Disease (asthma)

- Chronic inflammatory disorder affecting mast cells, eosinophils, and T lymphocytes
- Inflammation causes increase in bronchial hyper-responsiveness to variety of stimuli (dander, dust, pollen, etc.)
- Most common chronic disease of childhood; primary cause of school absences
Asthma, cont.

- **Pathophysiology**
  - Increased airway resistance, decreased flow rate; bronchospasm
  - Increased work of breathing
  - Progressive decrease in tidal volume

- **Arterial pH changes:** respiratory alkalosis, metabolic acidosis

- **Characterized by**
  - Mucosal edema, non-productive cough
  - Wheezing (r/t bronchospasm)
  - Mucus plugging
Medications for RAD

- Combination of bronchodilators and antiinflammatories
- Inhaled steroids first-line tx
- Regimen depends on classification of child’s asthma
Medications, cont.

- “Rescue”: short-acting beta agonists (Ventolin, Proventil)
  - Anticholinergics
  - Mast cell inhibitors (Intal)
  - Systemic corticosteroids (for short course management)
Purpose of the MDI

- Shake vigorously prior to use
- Exhale slowly and completely
- Place mouthpiece in mouth, closing lips around it
- Press and release the med while inhaling deeply and slowly
- Hold breath for 10 seconds and exhale
- Repeat x1
“Triggers” of asthma

- Exercise
- Infections
- Allergens
- Weather changes
Interpreting Peak Expiratory Flow Rates

- **Green**: (80-100% of personal best) signals all clear and asthma is under reasonably good control.

- **Yellow**: (50-79% of personal best) signals caution; asthma not well controlled; call dr. if child stays in this zone.

- **Red**: (below 50% of personal best) signals a medical alert. Severe airway narrowing is occurring; short acting bronchodilator is indicated.
Cystic Fibrosis

Cystic fibrosis is a hereditary disorder characterized by lung congestion and infection and malabsorption of nutrients by the pancreas.

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Cystic Fibrosis

[Genetic pedigree diagram showing genetic inheritance of Cystic Fibrosis (CF) with symbols for carriers and unaffected individuals.]
Cystic Fibrosis (CF)

- Factor responsible for manifestations of the disease is mechanical obstruction caused by increased viscosity of mucous gland secretions.
- Mucous glands produce a thick protein that accumulates and dilates the glands.
- Passages in organs such as the PANCREAS become obstructed.
- First manifestation is **meconium ileus in NB**.
- Sweat chloride test.
Cystic Fibrosis, cont.

- Systems affected:
  - Respiratory: thick mucus, inflammation, wheezing, pneumonia, cough, CHF in latter stage
  - Pancreas: obstructed pancreatic ducts by mucus and pancreatic enzymes (trypsin, lipase, amylase) to duodenum
  - GI: decrease in absorption of nutrients, fatty stools (steatorrhea), flatus, usually thin
  - Reproductive: 99% of males are sterile
Physical findings of the CF patient

- Frequently admitted with FTT
- Clubbing of the fingers
- Barrel chest
- Increased respirations, cyanosis
- Productive cough
Diagnostics for CF

- Positive sweat test (*pilocarpine iontophoresis*)
- 72 hr. fecal fat determination
- Fasting blood sugar
- Liver function studies
- Sputum culture (to ID infective organisms)
- CXR
Planning the care for a CF child

- Respiratory goal:
- Nutritional:
  - Fat soluble vitamins ADKE
  - High calorie, high protein, low fat
- Maintain Na balance (when sweating and ill)
- Thairapy vest