CHILD WITH A RESPIRATORY CONDITION

Chapter 30

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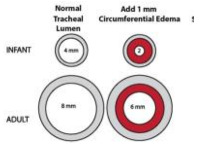
Development of Respiratory Tract

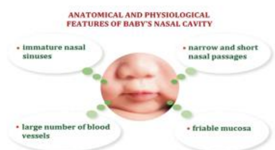
- Lungs at birth
  - Filled with amniotic fluid
  - First breath – what happens to fluid?
- Alveoli
  - Full-term birth: 20-50 million alveoli
  - Increase until 300 million present

Development of Respiratory Tract

- Child v. Adult
  - Nose
    - Narrower; no cilia
  - Maxillary/frontal sinuses
    - Not well developed
  - Nasopharyngeal/palatine tonsils
    - Gradually develop until age 10

Development of Respiratory Tract

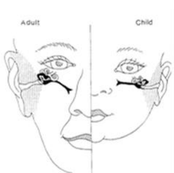


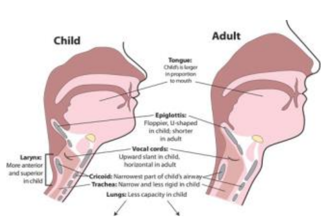


Development of Respiratory Tract

- Eustachian tubes
  - Wider and shorter
- Throat
  - Longer and narrower
- Trachea and bronchi
  - Soft cartilage, smaller lumen, lack of elastic tissue, poor ciliary movement

Development of Respiratory Tract





Health History

Important questions

- Family hx of chronic lung diseases
- Exposure to environmental toxins
- Exposure to smoking
- Respiratory conditions at birth
- Acute or chronic conditions

Physical Assessment

Auscultation

- Identify lung sounds
  - Normal? Adventitious?
- Alternate between both sides for comparison
- Breath sounds best when child at rest

Physical Assessment

Percussion

- Evaluate lung resonance
- Compare sides
- Types:
  - Indirect percussion
  - Direct percussion

Physical Assessment

- Olfaction
- Palpation
  - Chest movement and respiratory effort
- Inspection
  - Visually looking at chest
  - Similar to general observations

Physical Assessment
Abnormal Breathing Patterns

- Kussmaul
- Bradypnea
- Tachypnea
- Cheyne-Stokes
- Hyperventilation
- Hypoventilation
- Apnea

Physical Assessment

Chest Configuration

- Barrel chest
- Pigeon chest
- Funnel chest

Physical Assessment

Chest movements

- Normal
  - Bilateral, symmetric, rise and fall with inspiration/expiration
- Infants and young children
  - Less pronounced; abdomen rises as chest does with inspiration

**Diaphragm main respiratory muscle under 6 years old

Physical Assessment

Respiratory Distress

- Tripod position
  - Increases ability to use thoracic and neck muscles as accessory to respiratory muscles
- Sniffing position
  - Tilt head back to maximize effort to draw air into lungs via nose

Physical Assessment

- Tripod

- Sniffing

Physical Assessment

Evaluate energy and effort to breathe:

- Accessory muscle use
- Chest retractions
  - Beneath breastbone: ___________________
  - Above collarbone: _____________________
  - Between ribs: ______________________
  - Beneath ribs: _____________________

https://www.youtube.com/watch?v=yBVk_Bnyadc

Respiratory Abnormalities

Types of respiratory distress

- Cyanosis: bluish coloring
- Nasal flaring: nares open wider with each inspiration
- Diaphoresis: increased sweat
- Head bobbing: thrust head forward with inspiration

https://www.youtube.com/watch?v=7_U5eKNJrTo

Picture 1 Some signs of respiratory distress.

Respiratory Abnormalities

Adventitious Breath Sounds

- Wheezing
  - Whistling noise with inspiration/expiration
- Crackles/rales
  - High pitched, intermittent
- Sibilant rhonchi
  - Musical hissing or squeaking

Respiratory Abnormalities

Adventitious Breath Sounds

- Sonorous rhonchi
  - Course, snoring sound on inspiration and expiration
- Stridor
  - High-pitched sound on inspiration
  - **Considered severe symptom**
- Grunting
  - Heard with expiration

https://www.youtube.com/watch?v=KQTEu1mpRY8

NCLEX Question

The nurse notes that a 6-month-old child's abdomen rises and falls with respirations. What should this indicate to the nurse:

a. Onset of tonsillitis

b. Normal respirations

c. Acute respiratory distress

d. Obstructed nasal passages

Overall Interventions for a Child with Resp. Difficulties
Emergency Interventions

- Supplemental O2
- Airway management
- Suction
- Foreign body (FB) aspiration
- Cardiopulmonary Resuscitation (CPR)
- Tracheostomy
- Endotracheal intubation
- Mechanical ventilation

Oxygen Therapy Guidelines Based on Severity

Most common oxygen delivery approaches

- Oxygen tent
- Oxygen hood
- Blow-by oxygen

Oxygen Therapy Guidelines Based on Severity

- Nasal cannula: 0.25-2L for infant
- Nasal cannula: 0.5-4L for child
- Simple mask: 5-8L for infant
- Simple mask: 6-10L for child
- Nonrebreather: NOT appropriate for infants
- Nonrebreather: 10-15L for child

Oxygen Therapy Guidelines Based on Severity

- Venturi mask: NOT appropriate for infants

- Aerosol: for medications

Interventions to Assist Child with Respiratory Distress

- Chest physiotherapy
  - Gentle percussion to mobilize secretions
  - https://www.youtube.com/watch?v=3N8kyc7AqKU
- Nasal suctioning
  - Suction catheter or bulb syringe
- Breathing exercises
  - Coughing/deep breathing

Interventions to Assist Child with Respiratory Distress

- Apnea monitor
- Oxygen saturation machine

Common Respiratory Disorders

1. Apparent life-threatening Event (ALTE)

- Assessment
  - Risk factors, testing (CXR, EKG, CBC, CMP, ABG, UA/BC, RSV swab, LP
- Interventions
  - Depends on cause
- Nursing care
  - Education on cardiopulmonary home monitoring
  - CPR, support

Common Respiratory Disorders

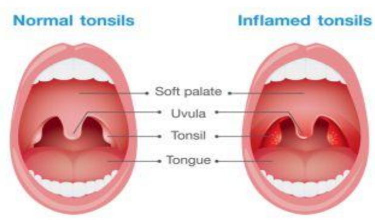
2. Nasopharyngitis: common cold

- Assessment
  - Nasal swelling/congestion, coughing, sore throat, HA, sinus pressure/pain, fever, chills, watery or itchy eyes
- Interventions
  - Tx of symptoms, fluids, cool-mist humidifier, rest, avoid smoke
- Nursing care
  - Handwashing, cover mouth and nose education

Common Respiratory Disorders

3. Tonsillitis

- Assessment: throat pain made worse with swallowing = halitosis
- Adenoiditis, OM, nasal obstruction, peritonsillar abscess
- Blood tests? Vitals? Which is most important



Common Respiratory Disorders

Tonsillitis continued

- Interventions
  - Antibiotics! Tonsillectomy, medications
- Lab tests: GABHS
- Nursing care
  - Symptom management
  - Education
  - Post op education

Common Respiratory Disorders

Tonsillectomy Care

- Position: facilitate drainage
- Monitor
- Keep comfortable
- Hydrate
- Avoid acidic foods/red beverages
- Encourage rest

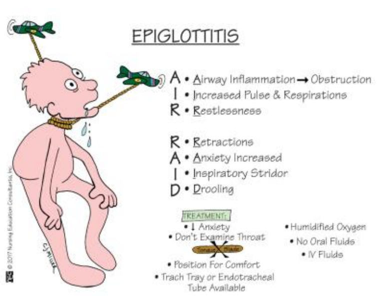
Common Respiratory Disorders

4. Epiglottitis

- Assessment
  - Initial mild with c/o sore throat, fever, hoarse voice, cough. THEN…
  - *Worsening* s/sx: drooling, no voice, tripod, mouth open
  - What should you NEVER do if you expect epiglottitis?
  - What should you do if you DO suspect epiglottitis?

Common Respiratory Disorders

- **Epiglottitis** continued
- Interventions
  - IV line, what are we giving?
- Nursing care
  - Maintain airway!!!
  - Oxygen administration/monitoring
  - Educate and encourage families about tx



Common Respiratory Disorders

5. Croup

- Assessment
  - Insp stridor, congested nose/throat, fever, laryngitis, "barky" cough
- Interventions
  - Typically symptom management
  - Steroids, inhalers, bronchodilators, cool mist humidifier

Common Respiratory Disorders

Croup continued

- Nursing care
  - Educate parents to recognize respiratory distress
  - Coughing at night: cool mist humidifier
    - Take child outside in cool air

Common Respiratory Disorders

6. Apnea

- Mostly seen in premature infant less than 35 wk
- Occurs during REM
- Can occur in first week of life
- Serious after birth or 2nd week of life
- Longer is lasts, cyanosis, bradycardic = SERIOUS

Common Respiratory Disorders

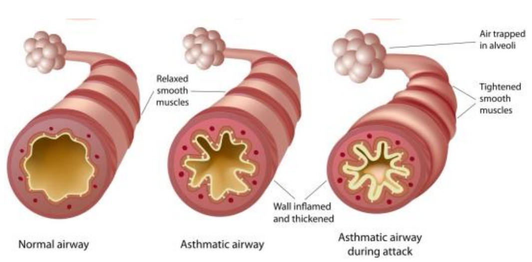
Apnea continued

- Interventions
  - Physical exam, CBC, CMP, xray, apnea study
  - Caffeine or CNS stimulant
  - CPAP
- Nursing care
  - Education, care, support
  - Apnea monitor
  - CPR training

Common Respiratory Disorders

8. Asthma

- Chronic, inflammatory disease with symptoms triggered by exposure to substances causing an allergic reaction
- One of leading causes of hospitalizations among children
- Bronchospasm from constriction of smooth muscle



Common Respiratory Disorders

Asthma continued

- Assessment
- Intermittent or constant cough, worsens at night
- Chest tightness/CP, fatigue, anxiety, sweating
- Wheezing, tripoding, accessory muscle use
- Mucous
- Decreased O_2 saturation
- Diagnosis?

Common Respiratory Disorders

- PFTs: most accurate test for diagnosis and severity
- PEFR: child needs to establish personal best
- Broncho provocation testing: multiple type test
- Skin prick
- CXR

Asthma Category per ATI

18.1 Effects of asthma on the child

		Intermittent	*Mild persistent*	*Moderate persistent*	*Severe persistent*
FREQUENCY OF FINDINGS		0 to 2 times/week	More than twice/ week, but not daily	Daily	Continually
NIGHTTIME FINDINGS	0- TO 4-YEAR-OLD	None	1 to 2 times/month	3 to 4 times/month	Frequent
	5- TO 11-YEAR-OLD	Two times a month or less	3 to 4 times/month	More than once/ week, but not daily	
ACTIVITY LIMITATIONS		None	Minor	Some	Extreme
USE OF A SHORT-ACTING BETA AGONIST		Less than twice/week	More than 2 days/ week, but not daily	Daily	Several times/day

Common Respiratory Disorders

Asthma continued

- Interventions
  - Supplemental O_2, suctioning, steroids, bronchodilators, sedation
- Nursing care
  - Airway management
  - IV
  - Test results
  - Education
  - Medications

Peak Flow Rate Analysis

18.2 Analysis of peak flow rates according to colored zones

	% OF PERSONAL BEST	ANALYSIS
GREEN	80% to 100%	Good control. Follow routine plan.
YELLOW	50% to 79%	Caution. This zone warns of an acute attack. Use maintenance medications. Notify provider if the peak flow rate stays in this zone.
RED	Less than 50%	Emergent action needed. Use a short-acting bronchodilator. Notify provider if the peak flow rate does not improve.

Common Respiratory Disorders

Asthma: Bronchodilators

- Inhalers:
  - Short-acting beta2 agonists (SABA)
    - Acute exacerbations
  - Long-acting beta2 agonists (LABA)
    - Prevent exacerbations NOT acute exacerbations
  - Cholinergic antagonists
    - Provide relief from acute bronchospasms

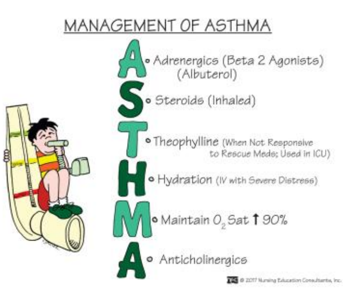
Common Respiratory Disorders

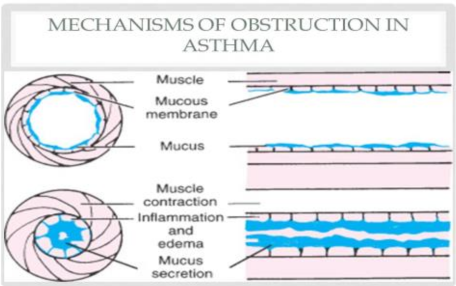
- Corticosteriods
  - Parenterally: methylprednisolone
  - Orally: prednisone
  - Inhalation: fluticasone
- Leukotriene modifier: zafirlukast, motelukast
- Mast cell stabilizer: cromolyn
  - Long term control
- Monoclonal antibiodies

Common Respiratory Disorders
Asthma-Reactive Airway Disease

Triggers
- Hypersensitivity
- URI
- Exercise
- Air pollutants
- Resp. infections
- GERD

S/Sx
- Cough
- Increased mucous
- SOB
- Wheezing/prolonged expiration
- Increased CO2 retention
- Chest tightness
- Retractions





Common Respiratory Disorders

9. Status Asthmaticus

- Life threatening
- Symptoms:
- Give corticosteroid and nebulizer
- Prepare for emergent intubation
- Additional medications: magnesium sulfate, ketamine, heliox

Common Respiratory Disorders

10. Bronchiolitis

- Assessment
  - Congestion, wheezing, coughing, decrease appetite, increased crying, fever, irritability, increased rate and work of breathing
- Interventions
  - Nasal swab (RSV), CXR, sputum/blood culture

Common Respiratory Disorders

Bronchiolitis continued

- Nursing care
  - Home care
    - Suctioning, fluids, rest, antipyretics
  - Hospitalization
    - IVF, oxygen therapy, prevent dehydration, antipyretics

Common Respiratory Disorders

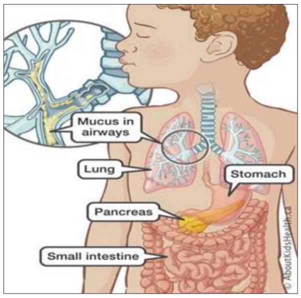
11. Cystic fibrosis

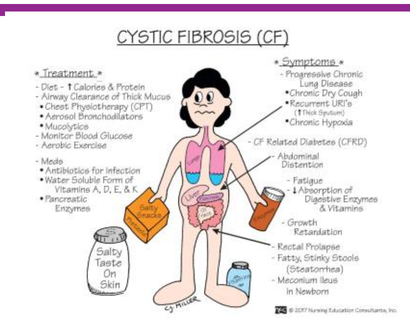
- Assessment
  - Excessive mucous production, excessive chloride production by sweat glands, decreased pancreatic enzyme production
    - Thick mucous block ovarian ducts, vas deferens, pancreatic duct, hepatic duct, gallbladder duct
    - Chronic cough, wheezing, hemoptysis, atelectasis, pneumothorax, apnea

Common Respiratory Disorders

Cystic fibrosis continued

- Interventions
  - Goal is to decrease severity of symptoms and decrease progression of disease
- Nursing care
  - Adequate fluids, fiber
  - High protein diet
  - Pancreatic enzymes, multivitamin, caloric supplement





Common Respiratory Disorders

12. Foreign body aspiration

- Assessment
  - Adventitious lung sounds, respiratory distress
- Interventions
  - Based on severity, primary goal is maintaining airway
- Nursing care
  - Rescue care if needed; education; med administration

Common Respiratory Disorders

FBA continued

- Phase 1
  - Choking, gagging, coughing, hoarseness, wheezing, stridor, circumoral cyanosis-possibility of death high
- Phase 2
  - Asymptomatic; can last months after aspiration
- Phase 3
  - Renewed symptoms, airway inflammation or infection, may cause coughing, wheezing, fever, sputum, hemoptysis

Common Respiratory Disorders

FBA continued

- Interventions
  - Monitory while child is actively breathing and coughing
  - Heimlich maneuver
  - No ________ __________
- Nursing care
  - Prevent complications
  - Education on prevention

NCLEX Question

The nurse is planning discharge teaching for a child with croup. What should the nurse suggest to ease the child's symptoms at home?

a. Place in a hot shower

b. Wrap in warm blankets

c. Provide with a hot drink

d. Take the child outside to breathe cool night air

NCLEX Question

Steven is a young child brought to ER by his parents because they say he is "very sick". S/S include:

Fever of 104F, stridor, sore throat. He is agitated and wants to sit up.

The nurse suspects what? What should she do first?

a. Assess for dehydration

b. Obtain a throat culture

c. Make Steven lie down

d. Call doctor and prepare pediatric tracheostomy set