

## **Cognitive & Sensory Impairments**

*Utilize your textbook Ch. 39 and your ATI chapter 37*

1. Differentiate between the anatomic and physiologic differences of the eyes and ears in children compared to adults—this includes the progression of normal visual and hearing development.
  - a. Eye cavity is larger in orbital duct making it more susceptible to injury and infection
  - b. Ear – Eustachian tubes are short and wide
    - Allows for bacteria and viruses to middle ear (otitis media)
    - Increases the number of infections
  - c. Birth visual acuity: 20/100-400
    - Age 6-7: 20/20

2. List the factors associated with disorders of the eyes and ears in infants and children

Ear:

- more prone to infection due to Eustachian tube shorter, wider, and horizontal which makes it easier for bacteria or viruses to enter the middle ear

Eye injuries:

- Eyelid injuries: assess laceration, visual is unaffected
  - May require suturing, refer to ophthalmologist
- Simple contusions (BLACK EYE): Bruising, Edema, PERRLA, extraocular movements, visual acuity is correct-no diplopia or blurred vision, pain around the eye not within
  - Apply ice 20 mins on 20 mins off (24H)
  - May take 3 weeks to resolve
- Sclera hemorrhage: Painless, appears as erythema, visual unaffected, (often caused by blunt trauma/ increased pressure)
  - Appearance can be frightening
  - No interventions needed
- Corneal abrasions: may have tearing, eye pain, PERRLA, vision may be blurry, photophobia
  - Analgesics (most heal on their own)
- foreign body: Tearing, “something in eye”, PERRLA, Vision may be blurry
  - Evert the eye and wipe away
  - Irrigate with saline

3. Define these refractory disorders: (light enters lens that does not bend) (most common visual difficulty seen in children)
- a. Myopia (nearsightedness)
    - Difficulty seeing faraway – you see better close
  - b. Hyperopia (farsightedness)
    - Difficulty seeing close – you see better far away
    - Not detected till age 7
  - c. Astigmatism
    - Imperfection in the curvature of the eye
    - Cornea curvature is uneven; light rays are reflected unevenly
    - s/sx
      - blurry vision
      - headaches
      - vertigo
      - Eye fatigue or strain
      - Head tilt
  - d. Amblyopia – LAZY EYE
    - Poor visual development in the structurally normal eye
    - **Most common cause of vision loss in children and young adults**
    - Vision in one eye is decreased because the eye and brain are not working together properly
    - Eyes fight to focus differently b/c different visual acuity (one eye becomes stronger than the other)
    - s/sx
      - Eye strain and Fatigue
      - Blurry vision
      - Poor depth perception
      - Problems with visual acuity
    - RN
      - Screening Pre-K age for Amblyopia
      - Observe for asymmetry of the corneal light reflex
      - May be only sign in preverbal children
      - Patch good eye for several hours each day □ promotes development in weaker eye
      - Daily use of atropine drops in better eye (blurs good eye) encourages use and development of weaker eye
  - e. Strabismus – EYES don't look the same direction
    - Misalignment of the eyes
      - Exotropia: eyes go outward – chameleon appearance
      - Esotropia: eyes go inward – cross eyed
      - Diplopia- double vision can occur
    - Usually resolves in 3 to 6 months
    - Greater than 4 months with esotropia refer to ophthalmologist
    - tx

- Patching
  - Corrective Lens
  - Eye muscle surgery
  - complications
    - Amblyopia
    - Visual defects
  - RN
    - Intermittent or continuous
    - Is it when they are tired?
    - Blurred vision, tired eyes, squinting, closing eye in sunlight, tilting head, bumping objects
    - Symmetry of corneal light reflex extremely helpful
    - “Cover test”
    - Encourage compliance when patching as prescribed
- f. Nystagmus - repetitive uncontrolled eye movements

2.

	<b>Risk factors/ Cause</b>	<b>Signs &amp; Symptoms</b>	<b>Treatment</b>	<b>Complications</b>	<b>Preventions/Nursing implications</b>
<b>Conjunctivitis</b> Inflammation of bulbar or palpebral conjunct. (Extremely contagious) <b>Bacterial-</b> Staphylococcus aureus Newborns: gonorrhea and chlamydia(risk for chlamydia pneumonia) <b>Viral---</b> Adenovirus and influenza	-Age younger than 2 weeks old -around a lot of kids -Viral URI -Pharyngitis Otitis Media	<b>bacterial:</b> Mucoid/Purulent drainage mild pain  <b>viral:</b> Mucoid/watery lymphadenopathy (edema of eyelid), photophobia, and tearing  <b>allergic</b> (pollen, hay, animals): Watery/itchy	<b>bacterial:</b> Antibiotic drops  <b>viral:</b> sx relief  <b>allergic:</b> Antihistamine drops/ Mast Cell drops	Report to Dr. if -Can't move eye -No improvement w IV antibiotics -Visual acuity changes	-Warm compresses on the eye -Encourage child not to rub eyes -Wash face and hands after outdoors -Shampoo before bed -WASH HANDS DILIGENTLY -Discourage them from sharing towels/washcloth
<b>Otitis Media</b>	-Eustachian tubes (short wide and not slanted) -bacterial infection (streptococcus	-Rubbing /Pulling/ tugging ears -Crying -fever -Lethargy -Bulging yellow or red TM	-Acetaminophen/ Ibuprofen -Antibiotics: Amoxicillin, Azithromycin (10 to 14) Ceftriaxone IM	-Hearing loss -speech delays	-Feed upright when positioning bottle or breast feeding -Clean external ears with sterile swabs apply antibiotic ointment

	<p>pneumonia, Haemophilus, influenza, Moraxella catarrhalis,)</p> <ul style="list-style-type: none"> <li>-winter and spring</li> <li>-Secondhand smoke</li> <li>-Cleft lip / palate</li> <li>-Noncompliance of vaccines</li> <li>-Downs syndrome</li> </ul>	<ul style="list-style-type: none"> <li>-Purulent material</li> <li>-Decreased TM movement</li> <li>-Lymphadenopathy of head and neck</li> <li>-Hearing difficulties and speech delay</li> </ul>	<ul style="list-style-type: none"> <li>-Wait 72 hrs. for spontaneous resolution</li> <li>-IM is used for resistant organisms</li> <li>-Benzocaine/Lidocaine</li> <li>-Do not use antihistamines</li> <li>-Pneumatic otoscope</li> <li>-Assess TM and movement</li> </ul>		<ul style="list-style-type: none"> <li>-Teach to avoid exposure to smoke</li> <li>-Stress importance of initial signs and infection</li> </ul>
<p><b>Otitis Media with effusion</b></p> <p>Presence of fluid in middle ear without s/sx of infection</p>	<ul style="list-style-type: none"> <li>-Lower occurrence in breastfed babies</li> <li>-winter and spring</li> <li>-Secondhand smoke</li> <li>-Cleft lip / palate</li> <li>-Noncompliance of vaccines</li> <li>-Downs syndrome</li> <li>-Eustachian tubes (short wide and not slanted)</li> </ul>	<ul style="list-style-type: none"> <li>-Feeling of fullness in ear</li> <li>-Orange discoloration of TM with decreased movement</li> <li>-Vague findings include Rhinitis, cough, and diarrhea</li> <li>-Transient hearing loss and balance disturbances</li> </ul>	<ul style="list-style-type: none"> <li>-Pneumatic otoscope</li> <li>-Assess TM and movement</li> <li>-sx relief</li> </ul>	<ul style="list-style-type: none"> <li>-Hearing loss</li> <li>-speech delays</li> </ul>	<ul style="list-style-type: none"> <li>-Feed upright when positioning bottle or breast feeding</li> <li>-Clean external ears with sterile swabs</li> <li>-Teach to avoid exposure to smoke</li> <li>-Stress importance of initial signs and infection</li> </ul>
<p><b>Infantile glaucoma</b></p>	<ul style="list-style-type: none"> <li>-Incest</li> <li>-autosomal recessive disorder</li> </ul>	<ul style="list-style-type: none"> <li>-Infant rubs eyes</li> <li>-Corneal enlargement and clouding</li> <li><b>-Eye will be enlarged, prominent</b></li> <li>-Photophobia</li> </ul>	<p>surgery</p>	<ul style="list-style-type: none"> <li>-Visual loss (corneal scarring)</li> <li>-Optic nerve damage</li> <li>-most common in amblyopia</li> </ul>	<ul style="list-style-type: none"> <li>-Post Op Care</li> <li>-Child should maintain bed rest</li> <li>-Protection of surgical site</li> <li>-Elbow restraints to avoid rubbing the eye</li> <li>-Use calm matter</li> </ul>

		-Tear or conjunctivitis -Eyelid squeezing/spasm (tonometer to measure IOP)			-Tell parents to avoid activity for 2 weeks -3 to 4 operations may be needed -Compliance of visual assessment
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5. What are the developmental/psychosocial implications of:

a. An alteration in vision?

- Any age:
  - Dull, vacant stare
- Infant
  - Does not “fix and follow”
  - Does not make eye contact
  - Unaffected by bright light
  - Does not imitate facial expressions
- Toddler and older child
  - Rubs, shuts, and covers eyes
  - Squints and blinks frequently
  - Holds objects close or sits close to TV
  - Bumps into objects
  - Displays head tilt or forward thrust

b. An alteration in hearing?

- Infant:
  - Wakes only to touch, not environmental noises
  - Does not startle to loud noises
  - Does not turn to sound by 4 months of age
  - Does not babble at 6 months of age •
  - Does not progress with speech development
- Young child:
  - Does not speak by 2 years of age
  - Communicates needs through gestures
  - Does not speak distinctly, as appropriate for his or her age
  - Displays developmental (cognitive) delays
  - Prefers solitary play
  - Displays immature emotional behavior
  - Does not respond to ringing of the telephone or doorbell
  - Focuses on facial expressions when communicating
- Older child:
  - Often asks for statements to be repeated

- Is inattentive or daydreams
- Performs poorly at school
- Displays monotone or other abnormal speech
- Gives inappropriate answers to questions except when able to view face of speaker
- At any age:
  - Speaks loudly
  - Sits very close to TV or radio or turns volume too loud
  - Responds only to moderate or loud voices

c. What are the implications for this in terms of nursing interventions?

- For visual impairment: supporting the child and family and promoting socialization, development, and education. In addition, when the child with a visual impairment is hospitalized for any reason, the nurse must plan appropriate care for that child, taking into consideration the child's level of disability

Table 39.1: Use the child's name to gain attention. • Identify yourself and let the child know you are there before you touch the child. • Encourage the child to be independent while maintaining safety. • Name and describe people/objects to make the child more aware of what is happening. • Discuss upcoming activities with the child. • Explain what other children or individuals are doing. • Make directions simple and specific. • Allow the child additional time to think about the response to a question or statement. • Use touch and tone of voice appropriate to the situation. • Use parts of the child's body as reference points for the location of items. • Encourage exploration of objects through touch. • Describe unfamiliar environments and provide reference points. • Use the sighted-guide technique when walking with a visually impaired child.

- For hearing impairment: The primary goal of nursing care for the child with a hearing impairment is to provide education and support to the family and child. Individualize care for the child with a hearing impairment and the family based on their specific responses to the hearing impairment. Educate on hearing aids, sign language, oral deaf education, cued speech, AAC. Provide support to the family and patient.

### **Alteration in Gas Exchange/Respiratory Disorders**

*Utilize Ch. 40 And ATI ch. 16, 17, 18, 9 pp.274-275 and ATI Real Nurse 2.0 Cystic Fibrosis*

1. What are the anatomical and physiological differences in children which make them more prone to respiratory disorders
  - a. By the age of the child

b. In comparison to adults

**Respiratory tract matures at 7 y/o**

- Newborns: Obligatory nose breathers until 4 weeks old
  - Produce little mucus (more susceptible to infections)
  - Small nasal passage this can cause excess mucus (airway obstruction)
  - Less likely to acquire sinus infections vs. adults (frontal and sphenoid sinus develop 6-8 years old)
- Infants: Tongue is larger than adults (in proportion)
  - Posterior displacement: can cause severe airway obstruction
  - Increased risk for hypoxemia due to decreased number of alveoli vs. adults
  - Chest walls- pliable whereas adult – supportive chest wall (ribs and sternum)
- Children: enlarged tonsils and adenoid tissues (can cause airway obstruction)
  - Airway lumen (trachea) smaller in children than adults
  - Airway is highly compliant- susceptible to collapse during airway obstruction

2. List the techniques for assessing normal respiratory status and the progression of a respiratory illness or disorder.

- Color: Pallor, Cyanosis
- Respirations: Rate & Depth, tachypnea, anxiety and restless
- Coughing and Airway noise
- Atelectasis, stridor, clubbing, respiratory effort

3. Define:

- a. Adventitious breath sounds (abnormal lung sounds)
  - Rhonchi (low pitch rattling), fine crackles, coarse crackles, pleural rubs, stridor
- b. Wheezes
  - High pitch expiration, obstruction lower trachea/bronchioles
- c. Crackles (rales)
  - Crackles (alveoli fluid filled), pneumonia
- d. Stridor
  - High pitch inspiratory, upper airway obstruction

Disorder	Causes	Expected Assessment Findings/ labs/Xrays	Treatments	Complications	Nursing Implications/ interventions
<b>Bronchiolitis from RSV</b>	RSV	-Pulse ox -Chest Radiography -ABGs	-O2 -Fluid -Corticosteroid	-Cyanosis/Hypoxia -Dehydration	-Fluids -O2 -Airway patent

		-NP swab/washing	Suction PRN	-Fatigue Respiratory distress	-HOB elevated -Suction
<b>Epiglottitis</b>	Haemophilus Influenza B	-High fever -Pain talking -Sit forward-neck extended - Neck XR	-IV antibiotic	-Respiratory arrest -Death -Pneumothorax -Pulmonary edema	-Airway patent -ICU
<b>Asthma</b>  <b>Mild-----</b> Sx are greater than 2 weeks night: 3-4 months  <b>Severe-----</b> Daily sx Night: 7 days a week	-History -Decreased BW -Overweight -Allergies -Smoke -Boys	-Chest tightness -Dyspnea -Cough/Wheezes -Coarse lung sounds -Anxiety -Use of accessory muscles -Decreased O2 -CBC -peak flow rate	-Bronchodilators -Corticosteroids -Anti-inflammatory	-Respiratory failure -Status asthmaticus (life threatening)	-Assess airway -Assess respiratory -SOB -Wheeze -Dyspnea -O2 % -Admin. O2
<b>Atopic dermatitis</b>	allergens, usually food such as eggs, wheat, milk, and peanuts or environmental triggers such as mold, dust mites, and cat dander. - high or low temperatures -perspiring -scratching -skin irritants -stress	- wiggling or scratching - dry skin - scratch marks noticed by parents - disrupted sleep - irritability - dry, scaly, or flaky skin - lesions, papules, or vesicles present - wheezing - rashes - serum immunoglobulin E may be elevated	- promote skin hydration - prevent infection - antihistamines	- infection in the skin - sepsis - scabbing of lesions - scarring	- keep child's fingernails short - perform and encourage hand hygiene often - antihistamine admin - assist with diversion therapy, imaginative therapy, and playing to distract from scratching - apply moisturiser multiple times throughout the day - prevent the child from scratching
<b>Acute rheumatic fever</b>	Strep	-Cardiomegaly -hx of Upper RI -Increased HR -High fever -Joint pain -Skin pain	-PCN -NSAIDS -Corticosteroids	-Sydenham Chorea -Erythema -HF - Cardiac Issues	-Assess respiration, hx, skin -Prolong EKG -PR interval

		-Throat culture -EKG: prolong PR interval			
<b>Cystic fibrosis</b>	-Inherited gene both parents (carry gene) -Caucasian	-Sweat Cl- test -Pulse ox -Chest Physiotherapy -pulmonary function test -blood sputum culture	-Respiratory medications -Antibiotics -Pancreatic enzymes -Vitamin ADEK	-Respiratory infection -Emphysema -Pneumothorax -GERD DM	-Respiratory care -Obtain sputum -Immunization Physical activity

#### 4. Medications

Medications	Category	Affects	Side Effects	Nursing implications
<b>Albuterol</b>	Beta 2 Adrenergic (short acting)	Relax airway smooth muscle (bronchodilation)	-Nervousness -Tachycardia -Jitteriness	Inhalation
<b>Budesonide (inhaled)</b>	Corticosteroids	Anti-inflammatory	-Possible Thrush -Dry mouth Hoarseness	-note cute wheezing -Rinse mouth after use Treatment
<b>Guaifenesin</b>	Expectorant	Low viscosity of secretions By increased respiratory tract fluid	-Dizziness -Decreased HR -Decreased BP -Dry mouth	-Deep breathing before coughing -Fluids -Assess breathing sounds
<b>Pseudoephedrine</b>	Decongestant	Treatment of runny and stuffy nose	-Nasal congestion -Excessive sleepiness Increased activity	Don't give to children under 6
<b>Prednisolone (PO)</b>	Corticosteroids	Suppress inflammation and normal immune response	<b>-Hyperglycemia</b> <b>-Immunosuppression</b>	Immunosuppression protocol

5.

Laboratory/diagnostic procedure	What does it test	Nursing implications
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<b>CBC</b>	RBC, platelet, WBC	Blood draw, normal values change with age
<b>Pulse oximetry</b>	O2 in blood	Noninvasive, probe applied correctly, and hooked to machine
<b>Peak Expiratory Flow</b>	Max air flow that is exhaled in 1 second (asthma control)	BID for 2 weeks average = personal best
<b>Chest Xray</b> Expanded lung and heart size Foreign body Hyperinflation Atelectasis Plural effusion	Bronchiolitis, pneumonia, and TB asthma, CF, bronchopulmonary, dyspnea	No metal, noninvasive, remove electrodes
<b>Pulmonary function test</b>	Respiratory flow and lung volume	Respiratory therapy does it Incentive Spirometry

6. List some common techniques/treatments to support respiratory functioning.
  - Oxygen, high humidity, suctioning, chest physiotherapy and postural drainage, saline gargles, saline lavage, chest tubes, bronchoscopy
  
7. List Nursing interventions commonly used for respiratory disorders
  - Elevated HOB, suction PRN, assess: respiratory, cardiac, O2 sat, deep breath and cough, hydration/fluids, pt education

### **Alteration in Perfusion/Cardiovascular Disorders**

*Utilize Ch. 41 And ATI ch.20 & Youtube video on fetal circulation & prior study of pathophysiology*

1. Compare fetal circulation of the heart and lungs versus newborn circulation.
  - Fetal circulation: umbilical arteries (2) and vein and placenta
    - Placental oxygenation
    - Lungs don't perform oxygenation and ventilation
      - HR present at 17 day
      - 4 chambers develop 6-8 weeks
    - **Foramen ovale**: opening between RA and LA (blood flows RA → LA)
      - (can lead to atrial septal defect (ASD))
    - **Ductus arteriosus**: opening between pulmonary artery and aorta (blood flow away from pulmonary circulation)

- (Can lead to patent ductus arteriosus (PDA))
- With first breath (newborn)
  - Lungs inflate ⇒ reducing pulmonary vascular resistance to blood flow ⇒
    - pulmonary artery pressure drops ⇒
      - promotes closure of ductus arteriosus
      - decrease pressure in RA ⇒
        - increased blood flow to L side of heart ⇒
        - increases pressure in LA ⇒
          - closure of foramen ovale
  - ductus venosus (between L umbilical cord vein and inferior vena cava) closes
    - Because lack of blood flow and vasoconstriction
    - Closed ductus venosus and ductus arteriosus eventually become ligaments

2. Diagram the normal blood flow and physiology of the cardiovascular system **with the pressure differences.**

Left side has higher pressure than right side

(Unoxxygenated blood) veins → inferior and superior vena cave → RA → tricuspid valve → RV → pulmonary valve → pulmonary artery → lungs (blood gets O<sub>2</sub>) → (oxygenated blood) pulmonary veins → LA → mitral valve → LV → aortic valve → aorta → rest of body via arteries

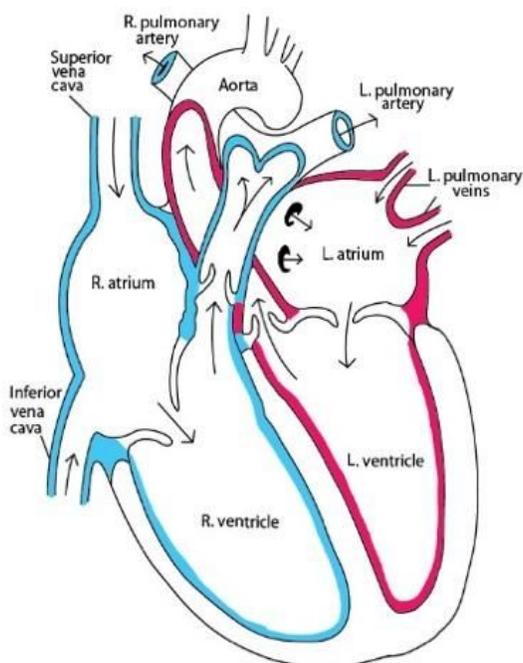


Figure 5.14 Direction of the flow of blood through the heart.

3. What are the anatomical and physiological differences of the cardiovascular system in infants and children.

- Infants
  - (and <7 y/o) heart lies more horizontally
    - Apex higher – 4<sup>th</sup> ICS
  - Immature myocytes are thinner and less compliant
  - Dependent on calcium for contraction
  - Heart at rest has greater resting tension (than adults) ⇒ volume loading and increased stretch occurs ⇒ decreased cardiac output
  - RV dominates at birth → first few months LV becomes dominant
- with time:
  - as lungs grow, heart displaced downward
    - school age: heart grows vertically
  - LV thickens
  - HR decreases
  - Heart efficacy increases
  - Blood vessels widen and increase in length
- Innocent murmurs can be heard in infants and children
- Age 1-6: heart x4 birth size
- Age 6-12: heart x10 birth size
- HR normal:
  - Infant: 90 - 160 bpm
  - Toddler/preschooler/school-age child: 70 – 115 bpm
  - Adolescent/adult: 60 - 100 bpm

4. What is a congenital heart defect? (CHD)

- Structural anomalies that are present at birth – born with it
- CHD largest % of birth defects
- Most common reason for hospital admission for children with CHD is HF
- **Complications:** HF, hypoxemia, failure to thrive
- Increased pulmonary blood flow: ASD, VSD, PDA
- Decreased pulmonary blood flow: tetralogy of Fallot, tricuspid atresia
- Obstruction of blood flow disorders: coarctation of the aorta, pulmonary stenosis, aortic stenosis
- Mixed blood flow: transposition of the great arteries, truncus arteriosus, hypoplastic left heart syndrome

5. What is an acquired heart disease?

- Disorders that occur after birth
- Wide range of causes or complication of long-term effect of CHD
- Types/causes
  - **Heart Failure** (most common)
    - Increased venous return to heart and lungs ⇒ pulmonary congestion ⇒ orthopnea
    - Thickening of LV
    - s/sx
      - Edema
      - Tachycardia
      - Tachypnea, SOB
      - Fatigue
      - Diaphoresis
      - Pallor/cyanosis
      - Weak, thready peripheral pulses
      - Crackles and wheezes
      - S3 or gallop or murmur heard
      - Cough (w bloody sputum)
      - Increased work of breathing (nasal flaring, retractions)
      - Skin cool, clammy, pale
      - Abdominal distention
    - Tx:
      - Lasix
      - Betablockers
    - RN:
      - Keep upright
        - Decreases venous return
        - Decreases pressure on diaphragm
        - Improves breathing
      - Promote oxygenation and ventilation
      - Assess fluid overload
      - Promote rest
      - Diet: low sodium, high protein, high calories
  - Rheumatic fever
    - Group A strep pharyngeal infection
    - Dx: modified Jones criteria
  - Cardiomyopathy
    - Risks
      - CHD
      - Maternal DM

- HTN
- Muscular dystrophy
- Hx of: myocarditis, HIV, Kawasaki
- Endocrine/autoimmune/connective tissue disease
- Ineffective endocarditis
  - Microbial infection of endothelial surfaces (inside)
  - CHD or prosthetic valves increase risk of acquiring
- Hyperlipidemia
- HTN
- Kawasaki disease
  - s/sx
    - high fever for 5 days – unresponsive to antibiotics
    - chills
    - N/D/HA
    - Malaise
    - Extreme irritability
    - Abdominal and joint pain
    - Peeling hands and feet

6. Congenital heart defects that **increase pulmonary blood flow. MOST common CHD.**

Defect	Pathophysiology	Signs & Symptoms	Treatments	Complications	Nursing implications
<b>Atrial septal defect (ASD)</b>	L→R shunt Hole between RA and LA Blood flows LA→RA *Leads to increased blood flow to lungs	Loud harsh murmur w fixed split-second heart sounds, HF, Asymptomatic	nonsurg -Closure during cardiac cath  surg- patch closure	HF, pulmonary HTN, atrial arrhythmia, stroke, blood clots, CHF, embolism	<b>Give O2</b> (<92%), promote oxygenation and ventilation, promote rest, <b>Pulse ox</b> (change locations every shift and assess skin) Assess resp and skin
<b>Ventricular septal defect (VSD)</b>	L→R shunt Hole between RV and LV, blood flows from LV→RV *Leads to increased blood flow to lungs	Loud harsh murmur at left sternal border, HF	<u>Can close on its own</u>  Nonsurg-closure during cardiac cath	Aortic valve regurgitation, ineffective endocarditis, pulmonary disease	<b>Give O2</b> (<92%), promote oxygenation and ventilation, promote rest, <b>Pulse ox</b> (change locations every

			Surg-complete repair w patch		shift and assess skin) Assess resp and skin
<b>Atrioventricular canal defect (AVSD)</b>  Likely in infants w Down syndrome	Recirculation of blood causing L→R shunt and creating increased workload of LV → causes pulmonary edema  (mix of blood, ASD and VSD)	Difficulty feeding (increased pulmonary pressure), HF	Lasix, ACEi, corrective heart surgery	Pulmonary edema, hypoxia	promote oxygenation and ventilation, promote rest, <b>Pulse ox</b> (change locations every shift and assess skin) Assess resp and skin
<b>Patent Ductus Arteriosus (PDA)</b>	Ductus arteriosus fails to close (hole between pulmonary artery and aorta) Blood will continue to flow back into pulmonary artery through PDA ⇒ <b>increase</b> in pressure, increase in workload of heart, increase in cardiovascular congestion	Murmur (machine hum/ray gun), wide pulse pressure, bounding pulses, HF, increased blood flow, asymptomatic	Surg-thoracoscopy repair  Nonsurg-insert coil to occlude PDA during cardiac cath	RV hypertrophy	<b>Give O2</b> (<92%), promote oxygenation and ventilation, promote rest, <b>Pulse ox</b> (change locations every shift and assess skin) Assess resp and skin

\*(increased blood flow to lungs → increase in pulmonary vascular resistance → pulmonary HTN and RV hypertrophy) (ASD, VSD))

7.

Laboratory/diagnostic procedure	What does it test	Nursing implications
<b>Cardiac catheterization</b>	Diagnose, repair, and evaluating dysrhythmias. Shows blockages (atherosclerosis)	Invasive, education, pre, intra, post procedure monitoring, discharge assistance
<b>Chest xray</b>	Determine heart size and chamber, and blood flow	Assist with positioning, no metal, noninvasive
<b>Echocardiogram</b>	ejection fraction rate, cardiac function assess: heart wall thickness, size of chambers, motion of valves and septa	Assist with positioning, noninvasive, lie still

<b>Electrocardiogram</b>	To identify cardiac dysrhythmias, rhythm, electrical impulses through the heart	12-lead or 3-lead 12-lead: smoke over fire, snow over grass Noninvasive, lie still (or else there will be artifact)
<b>Hemoglobin (Hgb) and hematocrit (Hct)</b>	shows oxygen in the blood, (O2 saturation) (measures total amount of Hgb in blood and RBC number and volume)	False results if dehydrated, capillary puncture, normal values vary with age
<b>Partial pressure of oxygen (pO2)</b>	using ABG, the o2 in blood	Most accurate with arterial specimen, observe for cyanosis, supplemental O2 per protocol, noninvasive

## 8. Medications

Medications	Category	Affects	Side Effects	RN
<b>Digoxin (Lanoxin)</b>  For: HF, AFib, SVT, Aflutter  Levels: 0.8-2 mcg/L	Cardiac glycoside/ antiarrhythmic agent	<b>Increases contractibility</b> <ul style="list-style-type: none"> <li>• Decrease conduction</li> <li>• Increase force</li> </ul> Slows HR Strengthen heartbeat	Bradycardia, N/V  Toxicity: bradycardia, dysrhythmias, N/V, anorexia	-Monitor pulse for full minute -Hold if HR: <ul style="list-style-type: none"> <li>• Infant &lt;90 bpm</li> <li>• Child &lt;70 bpm</li> <li>• Adult &lt;60 bpm</li> </ul> -Monitor electrolytes: hypokalemia = dig toxicity
<b>Lasix (furosemide)</b>  Manage: edema of HF, HTN (w/ antihypertensives)	Loop diuretic (acts in loop of Henle)	Inhibits reabsorption of Cl <sup>-</sup> and Na <sup>+</sup>  K <sup>+</sup> wasting diuretics – rid body of excess fluid and Na <sup>+</sup>  Fluid balance	Hypokalemia (muscle weakness, irritability, excessive drowsiness, ↑ or ↓ HR), N/V, dizziness, confusion	-Monitor: neuro, electrolytes, I&O -daily weights -Diet high in K <sup>+</sup> (bran cereals, tomatoes, potatoes, bananas, melons, oranges/OJ) -s/sx of worsening HF (increased sweating, decreased urinary output) -PO: dilute w juice (prevent GI upset and bad taste) -IV: push slow  -Administer with food or milk

				-Monitor B/P -Monitor renal function -Monitor electrolytes -Monitor hearing -Teach patient (family) about increased photo sensitivity.
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9. What is the most common cardiac defect that occurs in children with Down Syndrome?

- Atrioventricular canal defect (AVSD) and CHF

10. What signs and symptoms would you see in a child with a persistent cardiac disorder?

- Cyanosis, edema, clubbing, hypoxia, fever, decreased O<sub>2</sub>, prominence of precordial chest wall, visible, engorged, or abnormal pulsations, retractions, abdominal distension

11. Briefly explain the psychosocial impact of chronic cardiovascular disorders on children and their families.

- Amount of time kid and fam in dr. office
- Activity limitations
  - Think of ways for kid to get social interaction that are appropriate and is not running around
- Explain all that is happening with the child, using language the parents and child can understand.
- Allow the parents and child to voice their feelings, concerns, or questions.
- Provide ample time to address questions and concerns.
- Encourage the parents and the child, as developmentally appropriate, to participate in the child's care.