HELPFUL HINT

Review the anatomy and physiology of the heart and fetal circulation in an anatomy and physiology textbook.

MATCHING KEY TERMS

Match the term with the correct definition.

1. _______ angioplasty
2. _______ cardiomegaly
3. _______ compensation
4. _______ decompensation
5. _______ dysrhythmia
6. _______ palpitation
7. _______ pulmonary edema
8. _______ pulmonary hypertension
9. _______ pulmonary venous congestion
10. _______ shunt
11. _______ systemic venous congestion
12. _______ valvuloplasty

   a. Increased systemic venous pressure leading to excessive fluid in the systemic veins
   b. Abnormal blood flow from one part of the circulatory system to another
   c. Maintenance of adequate blood flow accomplished by cardiac and circulatory adjustments
   d. Procedure to open a valve
   e. Increased pulmonary pressure leading to excessive fluid in the pulmonary veins
   f. Procedure that dilates vessels
   g. Disturbance of rhythm
   h. Enlarged heart
   i. Collection of excess fluid in alveoli
   j. Sensation of rapid or irregular heartbeat
   k. Inability of the heart to maintain adequate circulation
   l. Increased pressure in pulmonary arteries and arterioles

MORE DEFINITIONS

Recall the definitions of the terms in italics in the following statements. Then, apply your knowledge and determine whether each statement is true (T) or false (F).

1. _______ Afterload is the amount of force against which ventricles contract.
2. _______ Central venous pressure (CVP) is measured in the left ventricle.
3. _______ A drug’s chronotropic effect has an affect on the heart’s rate.
4. _______ A drug’s inotropic effect has an affect on myocardial contractility.
5. _______ Preload is measured by determining CVP.
6. _______ Pulmonary vascular resistance affects the left ventricle.
7. _______ Regurgitation is the result of turbulent blood flow.
8. _______ Systemic vascular resistance is the amount of pressure exerted by the systemic vascular bed.
REVIEW OF THE CARDIOVASCULAR SYSTEM

Fill in the blanks.

1. In fetal circulation, gas exchange occurs at the ________________________.

2. In fetal circulation, oxygenated blood from the placenta flows from the right atrium into the left atrium through the ________________________.

3. After birth, the fetal shunt between the pulmonary artery and the aorta, which is called the ________________________, closes.

4. After birth, pulmonary vascular resistance ________________________ and the systemic arterial pressure ________________________.

CARDIOVASCULAR ASSESSMENT

Answer as either true (T) or false (F).

1. ______ Clubbing of nail beds indicates chronic hypoxia.

2. ______ A gallop is a missing heart sound.

3. ______ The point of maximal impulse (PMI) at the 7th intercostal space indicates cardiomegaly.

4. ______ Cool extremities in a warm room may indicate decreased cardiac output.

5. ______ Dyspnea is an indicator of congestive heart failure.

6. ______ S₂ is auscultated at the heart’s apex and correlates with the palpable pulse.

7. ______ squatting may be an attempt to improve cardiac circulation.

8. ______ Cardiac catheterization can be an interventional, as well as diagnostic, procedure.

PHYSIOLOGIC CONSEQUENCES OF CONGENITAL HEART DISEASE

1. In infants, early manifestations of congestive heart failure (CHF) include ________________________.

Match each drug or class of drugs with its description.

2. ______ furosemide a. Acts on distal renal tubules

3. ______ spironolactone b. Potassium-sparing diuretic

4. ______ thiazide diuretic c. Relaxes smooth muscles; decreases afterload

5. ______ digoxin d. Increases cardiac output; has positive inotropic and negative chronotropic effects

6. ______ vasodilator e. Potent loop diuretic

7. In an infant, fluid retention is monitored by ________________________.

8. Before administering digoxin, the nurse should count ________________________, check ________________________, and observe ________________________.

9. Polycythemia compensates for ________________________.

10. Treatment of hypercyanotic episodes includes ________________________

__________________________________________________________

__________________________________________________________

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Chapter 46 The Child with a Cardiovascular Alteration

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**LEFT-TO-RIGHT SHUNTING LESIONS AND OBSTRUCTIVE LESIONS**

1. ______________ can be managed medically with indomethacin in some cases.

2. Classic signs of ______________ are decreased pulses and blood pressure in the lower extremities.

3. ______________ is an abnormal opening between the ventricles, whereas ______________ is an abnormal opening between the atria.

4. Endocardial cushion defect is also known as ______________.

5. Narrowing at the entrance of the pulmonary artery is called ______________.

6. Thickening of the aortic valve is known as ______________.

**CYANOTIC LESIONS WITH ALTERED PULMONARY BLOOD FLOW**

Match each defect with its description.

1. ______ total anomalous pulmonary venous return
   - a. Defect composed of four distinct lesions

2. ______ transposition of the great arteries
   - b. Condition in which pulmonary artery and aorta are one vessel

3. ______ hypoplastic left heart syndrome
   - c. Failure of the pulmonary valve to develop

4. ______ pulmonary atresia
   - d. Absence of tricuspid valve

5. ______ tetralogy of Fallot
   - e. Inadequate development of left side of the heart

6. ______ tricuspid atresia
   - f. Reversal of the aorta and pulmonary artery

7. ______ truncus arteriosus
   - g. Absence of direct communication between the pulmonary veins and the left atrium

**ACQUIRED HEART DISEASE**

Answer as either true (T) or false (F).

1. ______ Gram-positive microorganisms are usually responsible for infective endocarditis.

2. ______ Immune complexes play a role in rheumatic fever.

3. ______ Kawasaki disease is an immune-mediated condition resulting in vasculitis.

4. ______ Antibiotic prophylaxis with penicillin for at least 5 years is part of the management of rheumatic fever without cardiac complications.

5. ______ Vegetation seen on echocardiogram suggests Kawasaki disease.

6. ______ Congenital heart malformations require infective endocarditis prophylaxis.

7. ______ Normal blood pressure for a child is defined as a systolic and/or diastolic blood pressure less than the 90th percentile for age and gender.

8. ______ Children with essential hypertension often have a family history of the disease.

9. ______ Renal disease is a complication of secondary hypertension.

10. ______ Non-pharmacologic therapies for hypertension are usually not effective.
CARDIOMYOPATHIES

1. Which type of cardiomyopathy is a major cause of sudden cardiac death in adolescents?

2. Which type of cardiomyopathy results from an infection or exposure to a toxin?

3. Drugs used to decrease ventricular hypercontractility and outflow tract obstruction are __________________________ and __________________________ blockers.

DYSRHYTHMIAS

1. Vagal maneuvers may be used to terminate an episode of __________________________.

2. Bradydysrhythmias are associated with __________________________.

3. In __________________________, there is no cardiac output.

4. Briefly placing an ice bag over an infant’s face may stimulate a __________________________ response.

5. In asystole, __________________________ is administered to stimulate cardiac activity.

HIGH CHOLESTEROL IN CHILDREN AND ADOLESCENTS

1. List the risk factors for coronary artery disease in children and adolescents.

2. In children, borderline levels for low-density lipoprotein (LDL) cholesterol are __________________________ mg/dl, and a high level for LDL is greater than __________________________ mg/dl.

SUGGESTED LEARNING ACTIVITIES

1. Role play with two other students. Have one student act as the nurse and another act as a parent who has just been told that his or her child has a cardiac defect and will require surgery. The third student should observe the interaction. After 10 minutes, discuss the role play. The “nurse” can describe how it felt to deal with the “parent.” The “parent” can describe which of the “nurse’s” interventions were effective and which could use improvement. The observer can describe the interchange from an objective viewpoint.

2. Interview the parent of a child who has had cardiac surgery in the past. Try to discover what the health care team did that was helpful for the family during the child’s hospitalization. What could have been done better?

3. Observe a cardiac catheterization. Design a teaching plan that describes to a 12-year-old child what to expect.
STUDENT LEARNING APPLICATIONS

Enhance your learning by discussing your answers with other students.

Michael is a healthy 10-year-old African-American undergoing a routine physical. His height and weight are at the 75th percentile. His blood pressure is at the 95th percentile for his age and gender, but a review of his chart reveals that his blood pressure has been slightly below the 90th percentile on previous visits.

1. Based on these findings, what questions would you, as his nurse, ask Michael and his parents?

2. How would you further assess his blood pressure?

The physician makes the diagnosis of essential hypertension and decides to initiate non-pharmacologic therapy.

3. How would you assess the family’s need for information about the following treatments?
   - Weight control
   - Physical conditioning
   - Dietary modifications
   - Relaxation techniques

4. What key features of these treatments would you stress when you present the information?

5. How would you evaluate the effectiveness of your presentation?

REVIEW QUESTIONS

Choose the correct answer.

1. In his physical assessment of an infant with a ventricular septal defect (VSD), the nurse notices dyspnea, hepatosplenomegaly, and periorbital edema. He understands that these are clinical manifestations of a. heart failure.
   b. endocarditis.
   c. fluid overload.
   d. decreased central venous pressure.

2. Percentiles for average blood pressure are based on a child’s
   a. weight and gender.
   b. age and gender.
   c. gender and race.
   d. age and weight.
3. Which of the following nursing interventions is not appropriate when caring for an infant with cardiovascular alterations?
   a. Discouraging breastfeeding
   b. Limiting bottle feedings to no longer than 30 minutes
   c. Maintaining a neutral thermal environment
   d. Providing periods of uninterrupted rest

4. Children with hypertension who are receiving loop diuretics are at risk for imbalances of
   a. calcium.
   b. chloride.
   c. potassium.
   d. sodium.

5. A toddler is hospitalized with CHF and is receiving digoxin and furosemide. She has vomited twice in the past 4 hours. The nurse’s best action is to
   a. increase the child’s fluid intake.
   b. omit the next dose of furosemide.
   c. check the child’s blood pressure before the next dose of digoxin.
   d. get an order to draw a digoxin level.

6. An infant with a left-to-right shunt is admitted to the hospital in CHF. Yesterday, she weighed 3.6 kg. A finding that indicates a worsening of her condition today is
   a. weight of 3.67 kg.
   b. urine output of 40 ml in the past 8 hours.
   c. rales in the lower lobes.
   d. all of the above.

7. While the nurse is doing a newborn assessment, he finds that the infant’s blood pressure in her arms is much higher than in her legs. The nurse suspects that the infant has
   a. aortic stenosis.
   b. atroventricular canal.
   c. coarctation of the aorta.
   d. truncus arteriosus.

8. Parents of a toddler with tetralogy of Fallot explain that they do not want him to overexert himself, so they always keep him in his playpen or crib to limit his mobility. Based on this information, the most appropriate nursing diagnosis is
   a. activity intolerance.
   b. risk for altered parenting.
   c. caregiver role strain.
   d. risk for altered growth and development.

9. While the nurse is taking routine vital signs, she notices that the infant is having a hypercyanotic episode. What should the nurse do first?
   a. Continue getting vital signs for a baseline comparison.
   b. Place the infant in a knee-chest position.
   c. Get a pulse oximetry reading.
   d. Give morphine sulfate.

10. Parents of children with congenital heart problems often experience loss of control when the child is hospitalized. The nurse who understands this will
    a. encourage parents to participate in their child’s care.
    b. explain procedures before performing them.
    c. answer questions honestly.
    d. do all of the above.

11. The father of a child with a congenital heart defect asks the nurse why his daughter has to take penicillin before she gets her teeth cleaned by the dentist. The nurse explains that this is necessary to prevent
    a. infective endocarditis.
    b. congestive heart failure.
    c. rheumatic fever.
    d. infected gums.

12. Which of the following is an indicator of infective endocarditis?
    a. Positive blood cultures
    b. Vegetation seen on Holter monitoring
    c. Decreased erythrocyte sedimentation rate
    d. All of the above