



13

Heart

LEARNING OBJECTIVES

After studying Chapter 13 in the textbook and completing this section of the workbook, students should be able to:

1. Describe anatomy and physiology of the heart.
2. Identify age and condition variations in the heart.
3. Describe interview questions pertinent to the heart examination.
4. Discuss inspection, palpation, percussion, and auscultation techniques for examination of the heart.
5. Describe age-specific and/or condition-specific variations in examination findings of the heart.
6. Identify examination findings associated with various conditions of the heart.

TEXTBOOK REVIEW

Chapter 13 Heart (pages 414–461)

CONTENT REVIEW QUESTIONS

Multiple Choice

Circle the correct answer for each of the following questions.

1. Dextrocardia is a condition characterized by which of the following? The:
 - a. right side of the heart is enlarged.
 - b. heart is to the right of the stomach.
 - c. heart is positioned to the right, either rotated or displaced.
 - d. blood sugar in the heart is higher than in other organs.
2. While auscultating the heart of an obese patient, the examiner should expect the heart sounds to be:
 - a. louder and closer.
 - b. softer and more distant.
 - c. louder and more distant.
 - d. softer and closer.

3. The examiner is unable to palpate the apical pulse. In addition, the heart sounds are very faint to auscultation. What condition should be considered?
 - a. pleural or pericardial fluid
 - b. congestive heart failure
 - c. mitral valve regurgitation
 - d. atrial septal defect

4. What disease process should the examiner consider if a patient reports a several-week history of fever and shows clinical symptoms of congestive heart failure?
 - a. bacterial endocarditis
 - b. infarction
 - c. myocarditis
 - d. cardiac tamponade

5. In order to accommodate the increased maternal blood volume in the pregnant woman, the:
 - a. heart rate drops in order to deal with greater cardiac output.
 - b. plasma volume decreases in order to allow for more erythrocytes.
 - c. left ventricle increases in both wall thickness and mass.
 - d. heart is shifted in position towards a more vertical orientation.

6. The examiner suspects a patient has pulmonary hypertension. What examination findings are consistent with this?
 - a. decreased intensity of S_1 heart sounds; increased intensity of S_2 heart sounds
 - b. a thrill palpated in area of apex
 - c. paradoxical splitting of S_1 and S_2 heart sounds
 - d. pericardial friction rub

7. Which of the following cardiac changes occur at birth in the normal child?
 - a. the foramen ovale opens
 - b. pressure in the right atrium rises
 - c. the ductus arteriosus closes
 - d. the relative mass of the left ventricle decreases

8. In most adults the apical impulse should be visible at the:
 - a. midaxillary line in the fifth right intercostal space.
 - b. sternal notch.
 - c. midclavicular line in the fifth left intercostal space.
 - d. costovertebral angle.

9. While palpating the precordium, a heave is identified, with lateral displacement of the apical pulse. Such a finding may indicate:
 - a. mitral regurgitation.
 - b. aortic stenosis.
 - c. left ventricular enlargement.
 - d. pericarditis.

10. A thrill generally indicates which of the following?
 - a. a disturbance in the electrical conductivity of the heart
 - b. a disruption of blood flow related to defect of closure in the semilunar valves
 - c. the presence of massive infection of the myocardium
 - d. pulmonary hypotension

11. Since percussion has a limited value in determining heart size, left ventricular size is better judged by:
 - a. auscultation of the heart sounds.
 - b. location of the apical pulse or PMI.
 - c. palpating the left sternal border.
 - d. palpating the heart base.
12. Which of the following is easily mistaken for cardiac-generated sounds?
 - a. bowel sounds
 - b. pulmonary insufficiency
 - c. pericardial friction rub
 - d. tracheal shifting
13. Cardiac tamponade is:
 - a. sudden in onset and requires immediate intervention.
 - b. easily detected by auscultation.
 - c. the result of excessive accumulation of fluid between the pericardium and the myocardium.
 - d. characterized by excessive cardiac relaxation, increased blood pressure, and bounding pulse.
14. In the presence of heart failure, which age group is most likely to exhibit liver enlargement before pulmonary edema?
 - a. infants
 - b. children
 - c. adolescents
 - d. older adults
15. During cardiac auscultation, the examiner notes a midsystolic murmur with a medium pitch; a coarse thrill is palpated as well. These findings are consistent with which condition?
 - a. aortic stenosis
 - b. aortic regurgitation
 - c. pulmonic stenosis
 - d. mitral stenosis
16. Which of the following reports made by a patient suggests compromised cardiac output?
 - a. "My heart pounds hard after going upstairs, but it settles down after I rest a minute."
 - b. "My right foot hurts a lot. I have also noticed it is colder and darker than the left foot."
 - c. "I have been really tired lately. By evening I am too tired to do anything but lie down."
 - d. "I keep getting sores on my legs and feet that take forever to heal."
17. Which of the following cardiovascular findings would be considered normal for a woman 8 months pregnant?
 - a. The heart position shifts up and to the left; the apex moves laterally.
 - b. Percussion reveals a decrease in left ventricular size.
 - c. Assessment of the lower legs reveal 3+ pitting edema.
 - d. Blood pressure is 150/118.
18. Which principle helps the examiner to determine where heart sounds are best heard?
 - a. The Doppler effect diminishes the sound over time.
 - b. Sound is transmitted in the direction of blood flow.
 - c. Accumulation of fluid magnifies the intensity of sound.
 - d. Duration of sound varies directly with frequency.
19. S₂ is:
 - a. the result of opening of the atrioventricular valves.
 - b. the beginning of systole.
 - c. best heard in the mitral area.
 - d. of higher pitch and shorter duration than S₁.

20. Splitting of heart sounds is:
 - a. an unexpected event that should be further evaluated.
 - b. the result of opening of the valves during exhalation.
 - c. greatest at the peak of inspiration.
 - d. due to synchronization of valve closure.

21. To distinguish a murmur from respiratory sounds in an infant, the examiner could correctly do which of the following?
 - a. time the sound with the carotid pulsation
 - b. distract the child with a moving toy
 - c. ask the child to hold his or her breath
 - d. use the flat side of the stethoscope to auscultate the child's chest

22. On a young child the examiner notes a systolic ejection murmur that is loud, harsh, and high in pitch heard over the second intercostal space along the left sternal border. What problem should the examiner suspect?
 - a. mitral valve prolapse
 - b. mitral valve stenosis
 - c. coarctation of the aorta
 - d. atrial septal defect

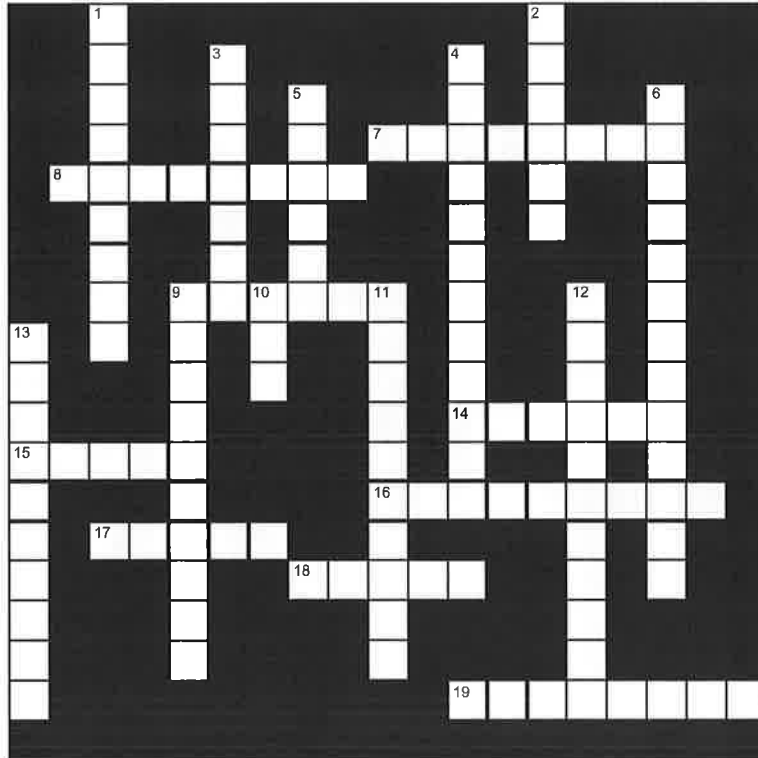
23. In order to hear low-pitched filling sounds of the heart, the examiner should place the patient in:
 - a. supine position and listen with bell of stethoscope.
 - b. a sitting position and listen with the diaphragm of the stethoscope.
 - c. a sitting position and listen with the bell of the stethoscope.
 - d. a left lateral recumbent position and listen with bell of stethoscope.

24. The heart rates of children:
 - a. are less variable than those of adults.
 - b. may increase significantly with each degree of temperature elevation.
 - c. react slowly to stress of any sort.
 - d. tend to increase with age.

25. Common cardiac findings among the elderly include:
 - a. vagal tone maintains the heart rate in a narrow range.
 - b. cardiac response to demands is rapid and effective.
 - c. apical pulse is more difficult to locate.
 - d. ectopic beats are usual and signal serious pathology.

Terminology Review

Crossword Puzzle



Across

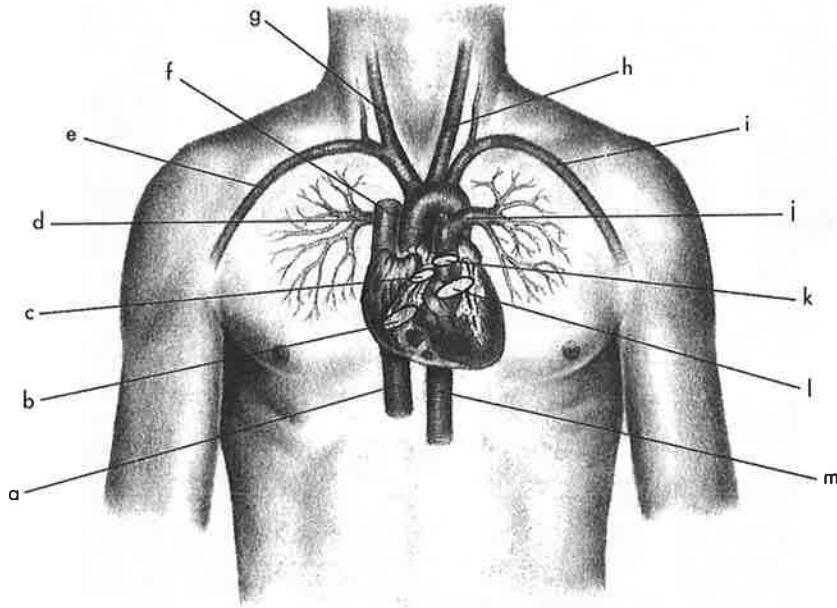
7. Fibers of the ventricular myocardium that conduct the electrical impulses in the heart
8. Phase of cardiac cycle where ventricles dilate
9. Partition dividing left and right heart chambers
14. Substernal pain or intense pressure radiating to neck, jaw, arms
15. Reservoirs for blood returning to heart
16. Fever occurring after streptococcal pharyngitis or skin infection; a systemic connective tissue disease
17. Percentage of increase in blood volume during pregnancy
18. Murmur occurring in healthy children 3 to 7 years of age
19. Valve that separates right ventricle from pulmonary artery

Down

1. Type of electrical conduction system that makes the heart autonomous
2. Fine, palpable, rushing vibration
3. Contraction phase of cardiac cycle
4. Enlargement of right ventricle secondary to pulmonary malfunction
5. Congenital syndrome that is characterized by cyanosis after the neonatal period
6. Backward flow of blood
9. Node where impulse of stimulation originates
10. Where apical pulse is most readily seen or felt
11. Middle layer of the heart; responsible for pumping action
12. Double-walled, fibrous sac encasing the heart
13. Myocardial necrosis secondary to abrupt decrease in coronary blood flow

Anatomy Review

On the illustration below, identify the structures of the heart by writing the correct term in the corresponding lettered answer space.



aorta
 aortic valve
 inferior vena cava
 left common carotid artery
 left pulmonary artery
 left subclavian artery
 mitral valve

pulmonic valve
 right common carotid artery
 right pulmonary artery
 right subclavian artery
 superior vena cava
 tricuspid valve

- a. _____
- b. _____
- c. _____
- d. _____
- e. _____
- f. _____
- g. _____

- h. _____
- i. _____
- j. _____
- k. _____
- l. _____
- m. _____

CONCEPTS APPLICATION

Complete the following table by indicating where you would auscultate to locate each.

<i>Valve</i>	<i>Where Would You Auscultate?</i>
Tricuspid valve	
Mitral valve	
Aortic valve	
Pulmonic valve	

CASE STUDY

Howard is a 76-year-old man complaining of difficulty breathing. Listed below are initial data collected during an interview and examination.

Interview Data

Howard doesn't know exactly when his breathing difficulty started, but it has gotten noticeably worse the last couple of days. He volunteers at the church library three mornings a week and plays golf twice a week. However, he tells the examiner that this last week he has "just felt too tired to do anything." Howard says that he has not been able to sleep very well at night because of his breathing difficulty. He adds, "I keep coughing out this frothy-looking phlegm." Howard denies taking any medications at this time. He says that he doesn't smoke or drink alcoholic beverages.

Examination Data

General survey: Alert, cooperative, well-groomed male. Appears stated age. Breathing is mildly labored.

Vital signs: Temperature 98.8° F (37.1° C). Pulse 120. Respirations 26. BP 142/112 right arm; 144/110 left arm.

Pulses: All pulses palpable 2+. No carotid bruits bilaterally.

Lower extremities: Skin warm and dry, without cyanosis. Even hair distribution. 2+ pitting edema noted bilaterally. No lesions present.

Neck: Jugular distension and pulsation noted with patient in supine position.

1. What data deviate from normal findings, suggesting a need for further investigation?
2. What additional questions could the nurse ask to clarify symptoms?
3. What additional physical examination, if any, should the nurse complete?
4. What kind of problems do you anticipate this patient will have?

CRITICAL THINKING

1. Mrs. Martin tells you that her 2 1/2-year-old son prefers to squat while watching TV rather than to sit on the couch or floor. What significance does this statement potentially have?
2. A 10-year-old girl is brought to the clinic by her mother. The mother tells the examiner that the girl has been very tired and short of breath, and she has been running a low-grade fever. These symptoms have been getting progressively worse over the last few weeks. The only significant health history is treatment for strep throat last month. What specifically should the examiner focus on to aid in the diagnosis?
3. Mr. Yazzie is a 42-year-old Native American with insulin-dependent diabetes mellitus (IDDM). He is seen in the clinic for a diabetic foot ulcer that does not heal. In what ways does IDDM increase Mr. Yazzie's risk for cardiovascular-related problems?