

Matching Questions

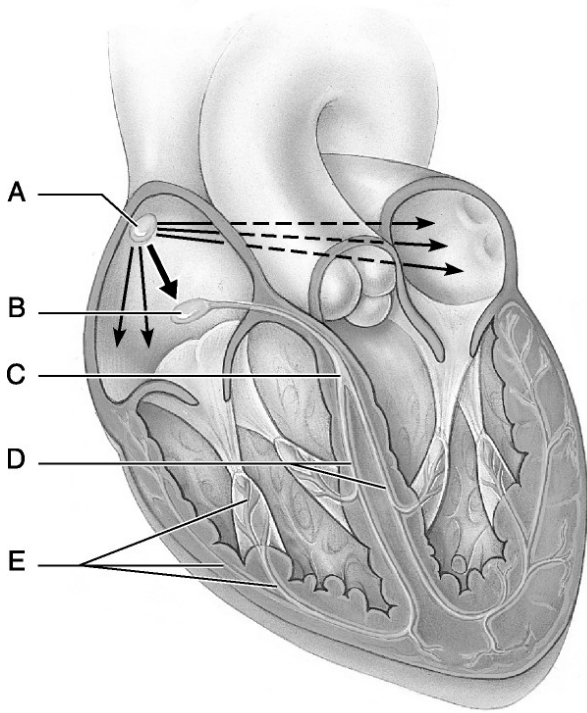


Figure 18.1

Using Figure 18.1, match the following:

1) Purkinje fibers.

Answer: E

Diff: 1 Page Ref: 694; Fig. 18.14

2) SA node.

Answer: A

Diff: 1 Page Ref: 694; Fig. 18.14

3) AV bundle.

Answer: C

Diff: 1 Page Ref: 694; Fig. 18.14

4) AV node.

Answer: B

Diff: 1 Page Ref: 694; Fig. 18.14

5) Bundle branches.

Answer: D

Diff: 1 Page Ref: 694; Fig. 18.14

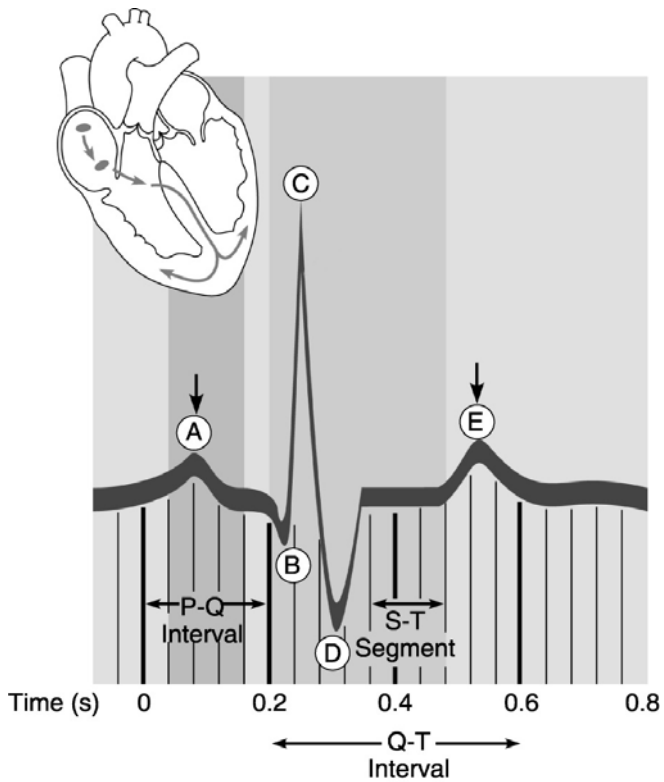


Figure 18.2

Using Figure 18.2, match the following:

6) Atrial depolarization.

Answer: A

Diff: 1 Page Ref: 695; Fig. 18.16

7) Point after which pressure begins to rise in the aorta.

Answer: D

Diff: 2 Page Ref: 695; Fig. 18.16

8) Point of the least ventricular volume.

Answer: E

Diff: 2 Page Ref: 695; Fig. 18.16

9) Point that represents the "dup" sound made by the heart.

Answer: E

Diff: 3 Page Ref: 696; Fig. 18.16



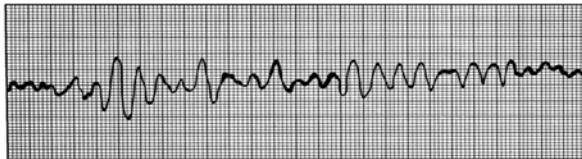
A



B



C



D

Figure 18.3

Using Figure 18.3, match the following:

10) Ventricular fibrillation.

Answer: D

Diff: 2 Page Ref: 697; Fig. 18.18

11) Second-degree heart block.

Answer: C

Diff: 3 Page Ref: 697; Fig. 18.18

12) Junctional rhythm.

Answer: B

Diff: 3 Page Ref: 697; Fig. 18.18

13) Normal sinus rhythm.

Answer: A

Diff: 3 Page Ref: 697; Fig. 18.18

Match the following:

14) The lining of the heart.

Answer: C

Diff: 1 Page Ref: 678-680

A) Epicardium

B) Parietal layer

15) Heart muscle

Answer: D

Diff: 1 Page Ref: 678-680

C) Endocardium

D) Myocardium

16) Serous layer covering the heart muscle.

Answer: A

Diff: 1 Page Ref: 678

17) The outermost layer of the serous pericardium.

Answer: B

Diff: 2 Page Ref: 678

Match the following:

18) The pacemaker of the heart.

Answer: A

Diff: 1 Page Ref: 693

A) SA Node

B) Purkinje fibers

19) Found in the interventricular septum.

Answer: D

Diff: 1 Page Ref: 693

C) AV node

D) AV bundle

20) Network found in the ventricular myocardium.

Answer: B

Diff: 2 Page Ref: 693

21) The point in the conduction system of the heart where the impulse is temporarily delayed.

Answer: C

Diff: 2 Page Ref: 693

Match the following:

22) Prevents backflow into the left ventricle.

Answer: C

Diff: 2 Page Ref: 688

23) Prevents backflow into the right atrium.

Answer: B

Diff: 1 Page Ref: 686

24) Prevents backflow into the left atrium.

Answer: A

Diff: 1 Page Ref: 686

25) Prevents backflow into the ventricles.

Answer: D

Diff: 1 Page Ref: 688

26) AV valve with two flaps.

Answer: A

Diff: 1 Page Ref: 686

27) AV valve with three flaps.

Answer: B

Diff: 1 Page Ref: 686

A) Mitral valve

B) Tricuspid valve

C) Aortic valve

D) Pulmonary valves

True/False Questions

- 1) The myocardium receives its blood supply from the coronary arteries.
Answer: TRUE
Diff: 1 Page Ref: 683-684
- 2) Cardiac muscle has more mitochondria and depends less on a continual supply of oxygen than does skeletal muscle.
Answer: FALSE
Diff: 1 Page Ref: 689
- 3) Proper function of the heart is dependent upon blood levels of ionic sodium.
Answer: FALSE
Diff: 1 Page Ref: 691
- 4) Congestive heart failure means that the pumping efficiency of the heart is depressed so that there is inadequate delivery of blood to body tissues.
Answer: TRUE
Diff: 1 Page Ref: 704-705
- 5) Tissues damaged by myocardial infarction are replaced by connective tissue.
Answer: TRUE
Diff: 1 Page Ref: 704-705
- 6) The left side of the heart pumps the same volume of blood as the right.
Answer: TRUE
Diff: 1 Page Ref: 684
- 7) Chronic release of excess thyroxine can cause a sustained increase in heart rate and a weakened heart.
Answer: TRUE
Diff: 1 Page Ref: 702
- 8) The mitral valve has chordae but the tricuspid valve does *not*.
Answer: FALSE
Diff: 1 Page Ref: 686
- 9) Trabeculae carneae are found in the ventricles and *never* the atria.
Answer: TRUE
Diff: 1 Page Ref: 683
- 10) The "lub" sounds of the heart are valuable in diagnosis because they provide information about the function of the heart's pulmonary and aortic valves.
Answer: FALSE
Diff: 2 Page Ref: 697-698
- 11) Autonomic regulation of heart rate is via two reflex centers found in the pons.
Answer: FALSE
Diff: 2 Page Ref: 695

- 12) The dicrotic notch refers to the brief rise in pressure caused by the closure of the AV valves during ventricular systole.
Answer: FALSE
Diff: 2 Page Ref: 698
- 13) An ECG provides direct information about valve function.
Answer: FALSE
Diff: 3 Page Ref: 695-696
- 14) As pressure in the aorta rises due to atherosclerosis, more ventricular pressure is required to open the aortic valve.
Answer: TRUE
Diff: 3 Page Ref: 704-705, 709
- 15) Proxysmal atrial tachycardia is characterized by bursts of atrial contractions with little pause between them.
Answer: TRUE
Diff: 2 Page Ref: 709

Multiple-Choice Questions

- 1) Normal heart sounds are caused by which of the following events?
A) excitation of the SA node
B) closure of the heart valves
C) friction of blood against the chamber walls
D) contraction of ventricular muscle
Answer: B
Diff: 1 Page Ref: 697-698
- 2) Cardiac reserve _____.
A) is determined by your genes and not subject to improvement
B) is unrelated to health
C) can be improved by regular exercise
D) can be determined by auscultation
Answer: C
Diff: 1 Page Ref: 700
- 3) Hemorrhage with a large loss of blood causes _____.
A) a lowering of blood pressure due to change in cardiac output
B) a rise in blood pressure due to change in cardiac output
C) no change in blood pressure but a slower heart rate
D) no change in blood pressure but a change in respiration
Answer: A
Diff: 1 Page Ref: 700
- 4) The left ventricular wall of the heart is thicker than the right wall in order to _____.
A) accommodate a greater volume of blood
B) expand the thoracic cage during diastole
C) pump blood with greater pressure
D) pump blood through a smaller valve
Answer: C
Diff: 1 Page Ref: 680, 683

5) Damage to the _____ is referred to as heart block.

- A) SA node
- B) AV valves
- C) AV bundle
- D) AV node

Answer: D

Diff: 1 Page Ref: 695

6) The P wave of a normal electrocardiogram indicates _____.

- A) ventricular repolarization
- B) ventricular depolarization
- C) atrial repolarization
- D) atrial depolarization

Answer: D

Diff: 1 Page Ref: 695

7) Blood within the pulmonary veins returns to the _____.

- A) right atrium
- B) left atrium
- C) right ventricle
- D) left ventricle

Answer: B

Diff: 1 Page Ref: 683

8) Small muscle masses attached to the chordae tendineae are the _____.

- A) trabeculae carneae
- B) pectinate muscles
- C) papillary muscles
- D) venae cavae

Answer: C

Diff: 1 Page Ref: 686

9) The term for pain associated with deficient blood delivery to the heart that may be caused by the transient spasm of coronary arteries is _____.

- A) ischemia
- B) pericarditis
- C) myocardial infarct
- D) angina pectoris

Answer: D

Diff: 1 Page Ref: 686

10) To auscultate the aortic valve, you would place your stethoscope _____.

- A) in the second intercostal space to the right of the sternum
- B) in the second intercostal space to the left of the sternum
- C) in the fifth intercostal space inferior to the left nipple
- D) in the fifth right intercostal space

Answer: A

Diff: 1 Page Ref: 698

11) Blood is carried to capillaries in the myocardium by way of _____.

- A) the coronary sinus
- B) the fossa ovalis
- C) coronary arteries
- D) coronary veins

Answer: C

Diff: 1 Page Ref: 685

12) When the heart is beating at a rate of 75 times per minute, the duration of one cardiac cycle is _____ second(s).

- A) 0.8
- B) 1.0
- C) 1.2
- D) 1.8

Answer: A

Diff: 1 Page Ref: 698

13) Which of the following factors does *not* influence heart rate?

- A) skin color
- B) age
- C) gender
- D) body temperature

Answer: A

Diff: 1 Page Ref: 702

14) Which of the following is *not* an age-related change affecting the heart?

- A) atherosclerosis
- B) decline in cardiac reserve
- C) fibrosis of cardiac muscle
- D) thinning of the valve flaps

Answer: D

Diff: 1 Page Ref: 708-709

15) If cardiac muscle is deprived of its normal blood supply, damage would primarily result from _____.

- A) decreased delivery of oxygen
- B) a decrease in the number of available mitochondria for energy production
- C) a lack of nutrients to feed into metabolic pathways
- D) an inadequate supply of lactic acid

Answer: A

Diff: 1 Page Ref: 692

16) Cardiac muscle cells are like skeletal muscle cells in that they _____.

- A) have gap junctions
- B) have end walls
- C) have I and A bands
- D) have intercalated disks

Answer: C

Diff: 1 Page Ref: 689

17) Cardiac output is about _____ L/min.

- A) 7.27
- B) 6.26
- C) 5.25
- D) 4.25

Answer: C

Diff: 1 Page Ref: 700

18) The pericardial cavity _____.

- A) is another name for the chambers of the heart
- B) is a space between the fibrous pericardium and the serous pericardium
- C) is the region of the thoracic cavity that contains the heart
- D) contains a lubricating fluid called serous fluid

Answer: D

Diff: 1 Page Ref: 678

19) If the length of the absolute refractory period in cardiac muscle cells was the same as it is for skeletal muscle cells _____.

- A) it would be much longer before cardiac cells could respond to a second stimulation
- B) contractions would last as long as the refractory period
- C) tetanic contractions might occur, which would stop the heart's pumping action
- D) it would be less than 1-2 ms

Answer: C

Diff: 1 Page Ref: 691

20) Norepinephrine acts on heart muscle cells by _____.

- A) decreasing heart contractility
- B) causing a decrease in stroke volume
- C) blocking the action of calcium
- D) causing threshold to be reached more quickly

Answer: D

Diff: 1 Page Ref: 702

21) If the vagal nerves to the heart were cut, the result would be that _____.

- A) the heart would stop, since the vagal nerves trigger the heart to contract
- B) the heart rate would increase by about 25 beats per minute
- C) the AV node would become the pacemaker of the heart
- D) parasympathetic stimulation would increase, causing a decrease in heart rate

Answer: B

Diff: 1 Page Ref: 702

22) Foramen ovale _____.

- A) connects the two atria in the fetal heart
- B) is a condition in which the heart valves do not completely close
- C) is a shallow depression in the interventricular septum
- D) is a connection between the pulmonary trunk and the aorta in the fetus

Answer: A

Diff: 1 Page Ref: 706

23) The stroke volume for a normal resting heart is _____ ml/beat.

- A) 30
- B) 50
- C) 70
- D) 90

Answer: C

Diff: 1 Page Ref: 700

24) Which vessel of the heart receives blood during right ventricular systole?

- A) venae cavae
- B) pulmonary artery
- C) aorta
- D) pulmonary veins

Answer: B

Diff: 1 Page Ref: 698

25) Blood enters which of these vessels during ventricular systole?

- A) aorta
- B) pulmonary arteries
- C) pulmonary vein
- D) aorta and pulmonary trunk

Answer: D

Diff: 2 Page Ref: 698

26) Which of the following is *not* part of the conduction system of the heart?

- A) AV node
- B) bundle of His
- C) AV valve
- D) SA node

Answer: C

Diff: 2 Page Ref: 693

27) The tricuspid valve is closed _____.

- A) while the ventricle is in diastole
- B) when the ventricle is in systole
- C) while the atrium is contracting
- D) by the movement of blood from atrium to ventricle

Answer: B

Diff: 2 Page Ref: 698

28) When holding a dissected heart in your hands, it is easy to orient the right and left side by _____.

- A) tracing out where the vena cava enters the heart
- B) noticing the thickness of the ventricle walls
- C) locating the aorta
- D) finding the pulmonary valves

Answer: B

Diff: 2 Page Ref: 683-684

- 29) Select the correct statement about the heart valves.
- A) The mitral valve separates the right atrium from the right ventricle.
 - B) The tricuspid valve divides the left atrium from the left ventricle.
 - C) Aortic and pulmonary valves control the flow of blood into the heart.
 - D) The AV valves are supported by chordae tendineae so that they do not blow back up into the atria during ventricular contraction.

Answer: D

Diff: 2 Page Ref: 686

- 30) Select the correct statement about the function of myocardial cells.
- A) The all-or-none law as applied to cardiac muscle means that the entire heart contracts as a unit or it does not contract at all.
 - B) Cardiac muscle cells are each innervated by a sympathetic nerve ending so that the nervous system can increase heart rate.
 - C) The refractory period in skeletal muscle is much longer than that in cardiac muscle.
 - D) The influx of potassium ions from extracellular sources is the initiating event in cardiac muscle contraction.

Answer: A

Diff: 2 Page Ref: 690-692

- 31) Select the correct statement about the structure of the heart wall.
- A) The fibrous skeleton forms the bulk of the heart.
 - B) Connective tissue in the heart wall aids in the conduction of the action potential.
 - C) The heart chambers are lined by the endomysium.
 - D) The myocardium is the layer of the heart that actually contracts.

Answer: D

Diff: 2 Page Ref: 680

- 32) Compared to skeletal muscle, cardiac muscle _____.
- A) has gap junctions that allow it to act as a functional syncytium
 - B) lacks striations
 - C) has more nuclei per cell
 - D) cells are larger than skeletal muscle cells

Answer: A

Diff: 2 Page Ref: 689

- 33) Cardiac muscle _____.
- A) has fewer mitochondria than skeletal muscle
 - B) relies mostly on glycolysis for energy
 - C) has sarcomeres with A bands and I bands
 - D) can operate for long periods without oxygen as long as lactic acid is present

Answer: C

Diff: 2 Page Ref: 689-690

- 34) The deflection waves in an ECG tracing include _____.
- A) the P wave, which is present only in patients who have had a heart attack
 - B) the Q-T interval, which indicates the time of atrial contraction
 - C) the PQRS complex, which follows ventricular contraction
 - D) the T wave, which indicates ventricular repolarization

Answer: D

Diff: 2 Page Ref: 696

35) During the period of ventricular filling _____.

- A) pressure in the heart is at its peak
- B) blood flows passively through the atria and the open AV valves
- C) the atria remain in diastole
- D) it is represented by the P wave on the ECG

Answer: B

Diff: 2 Page Ref: 698

36) The effect of endurance-type athletic training may be to lower the resting heart rate. This phenomenon _____.

- A) is a sign of dangerous overexertion
- B) is caused by hypertrophy of the heart muscle
- C) results in decreased cardiac output
- D) does *not* occur in aerobic training

Answer: B

Diff: 2 Page Ref: 704

37) The second heart sound is heard during which phase of the cardiac cycle?

- A) isovolumetric relaxation
- B) isovolumetric contraction
- C) ventricular ejection
- D) ventricular filling

Answer: A

Diff: 3 Page Ref: 698

38) The time of day most hazardous for heart attacks is _____.

- A) morning
- B) noontime
- C) evening
- D) during sleep

Answer: A

Diff: 1 Page Ref: 706

39) If a significant amount of connective tissue were to develop connecting the visceral and parietal pericardial layers together, which of the following would be a likely consequence?

- A) interference with normal mechanical cardiac activity
- B) strengthening of the delicate pericardial layers and an improvement of cardiac function
- C) decreased production of fluid in the pericardial cavity since it is no longer necessary
- D) decreased friction between the visceral and parietal layers

Answer: A

Diff: 2 Page Ref: 678, 680

40) If we were able to artificially alter the membrane permeability of pacemaker cells so that sodium influx is more rapid _____.

- A) heart rate would increase due to a decreased time for depolarization of the pacemaker cells
- B) slow calcium channels in the pacemaker tissue would be cycling at a greater rate
- C) heart rate would decrease, but blood pressure would rise due to the excess sodium present
- D) tetanic contraction would occur due to the short absolute refractory period of cardiac muscle

Answer: B

Diff: 3 Page Ref: 691

- 41) Select the correct statement about cardiac output.
- A) A slow heart rate increases end diastolic volume, stroke volume, and force of contraction.
 - B) Decreased venous return will result in increased end diastolic volume.
 - C) If a semilunar valve were partially obstructed, the end systolic volume in the affected ventricle would be decreased.
 - D) Stroke volume increases if end diastolic volume decreases.

Answer: A

Diff: 2 Page Ref: 700

- 42) During contraction of heart muscle cells _____.
- A) the action potential is initiated by voltage-regulated slow calcium channels
 - B) some calcium enters the cell from the extracellular space and triggers the release of larger amounts of calcium from intracellular stores
 - C) the action potential is prevented from spreading from cell to cell by gap junctions
 - D) calcium is prevented from entering cardiac fibers that have been stimulated

Answer: B

Diff: 2 Page Ref: 701

- 43) Isovolumetric contraction _____.
- A) refers to the short period during ventricular systole when the ventricles are completely closed chambers
 - B) occurs while the AV valves are open
 - C) occurs immediately after the aortic and pulmonary valves close
 - D) occurs only in people with heart valve defects

Answer: A

Diff: 3 Page Ref: 698

- 44) Commotio cordis is heart failure due to a _____.
- A) mild electrical shock
 - B) severe electrical shock
 - C) relatively mild blow to the chest
 - D) loss of blood

Answer: C

Diff: 3 Page Ref: 709

- 45) Negative chronotropic factors are factors that _____.
- A) decrease afterload
 - B) increase afterload
 - C) decrease heart rate
 - D) increase heart rate

Answer: C

Diff: 1 Page Ref: 702, 704

Fill-in-the-Blank/Short Answer Questions

- 1) The enlarged coronary vessel outside the heart that empties blood into the right atrium is the _____.

Answer: coronary sinus

Diff: 1 Page Ref: 686

- 2) In the fetal heart there is a foramen _____ that allows blood to flow from the right atrium directly to the left atrium.

Answer: ovale

Diff: 1 Page Ref: 705-706

- 3) The _____ cells of the heart do *not* maintain stable resting membrane potentials; therefore, they continually depolarize.
Answer: autorhythmic
Diff: 1 Page Ref: 692
- 4) Specialized conductive cells of the ventricles are called _____ fibers.
Answer: Purkinje
Diff: 1 Page Ref: 693
- 5) The ECG T wave interval represents _____.
Answer: ventricular repolarization
Diff: 1 Page Ref: 696
- 6) $CO = \text{_____} \times SV$.
Answer: HR or heart rate
Diff: 1 Page Ref: 700
- 7) The _____ membrane covers the heart.
Answer: visceral layer (epicardium)
Diff: 1 Page Ref: 678
- 8) The _____ valve of the heart has three valves with chordae tendineae.
Answer: tricuspid
Diff: 1 Page Ref: 686
- 9) The _____ and _____ valves of the heart have *no* chordae tendineae attached.
Answer: aortic; pulmonary
Diff: 1 Page Ref: 686, 688
- 10) Define *systole* and *diastole*. Which heart chambers are usually referenced when these terms are used?
Answer: Systole is contraction of the muscle. Diastole is relaxation of the muscle. The contraction and relaxation of the ventricles are normally described with the terms systole and diastole.
Diff: 1 Page Ref: 698
- 11) Define the terms *end diastolic volume* (EDV) and *end systolic volume* (ESV) and relate them to the calculation of stroke volume.
Answer: EDV is the amount of blood that collects in a ventricle during diastole. ESV is the volume of blood remaining in a ventricle after it has contracted. Stroke volume (ml/beat) equals EDV - ESV.
Diff: 1 Page Ref: 700
- 12) What is the difference between the auricles and the atrium?
Answer: Auricles are the flaplike appendages attached to the atria that increase the atrial volume.
Diff: 1 Page Ref: 680
- 13) The heart is called a "double pump" because there are two functionally separate circulations. Trace the pathway of each of these circulations and include the following information: heart chambers involved, major blood vessels involved, and general areas through which the blood flows. Begin with the right atrium.
Answer: Right atrium to right ventricle to pulmonary arteries to lungs (pulmonary circuit pump); pulmonary veins to left atrium to left ventricle to aorta to body tissues to venae cavae (systemic circuit pump).
Diff: 2 Page Ref: 684-686

- 14) What two important functions does the cardiac conduction system perform?
Answer: The important functions of the cardiac conduction system are to initiate impulses (pacemaker) and to distribute impulses throughout the heart so that it depolarizes and contracts in an orderly, sequential manner.
Diff: 2 Page Ref: 690-692
- 15) Explain autorhythmicity in cardiac muscle cells.
Answer: Autorhythmic cells do not maintain a stable resting membrane potential. Instead, they have an unstable resting potential that continuously depolarizes, drifting toward threshold for firing.
Diff: 3 Page Ref: 692
- 16) Why is oxygen so much more critical to the heart muscle than to skeletal muscles?
Answer: Skeletal muscles can go into oxygen debt by burning sugars anaerobically; the heart cannot do this. Since there is no stored oxygen in the cardiac cells, any occlusion to the heart is extremely serious.
Diff: 3 Page Ref: 692
- 17) What is the functional importance of the intercalated discs of cardiac muscle? What is the functional importance of the fibrous skeleton of the heart?
Answer: Intercalated disks contain anchoring desmosomes that prevent cell separation, and gap junctions that allow ions to travel from cell to cell. The fibrous skeleton is connective tissue that reinforces the myocardium internally.
Diff: 2 Page Ref: 689
- 18) What is bradycardia?
Answer: Bradycardia is simply slowing the heart rate below 60 beats per minute.
Diff: 1 Page Ref: 704
- 19) Why is fibrosis of the cardiac muscle serious?
Answer: As the heart muscle stiffens it is unable to fill the atria as it once did, therefore less blood is pumped. Further, as the muscle stiffens it takes more energy to expel the bolus of blood from the heart which will eventually weaken the heart.
Diff: 2 Page Ref: 708-709
- 20) Would an ECG with an inverted QRS wave be of concern to the doctor?
Answer: Not normally. What has probably happened is the technician has reversed the polarity on the leads causing the inverted wave.
Diff: 2 Page Ref: 696

