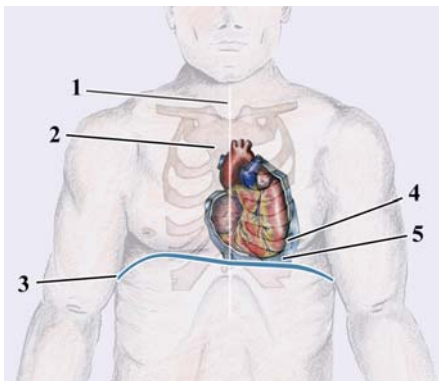


# The Heart - Worksheets

- 1 What is the name of the central region of the thorax? \_\_\_\_\_
- 2 About how much of the heart is to the left of the mid-sternal line? \_\_\_\_\_
- 3 Where is the location of the apex of the heart? \_\_\_\_\_



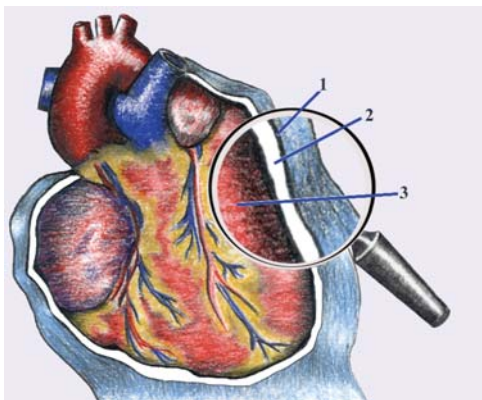
**Figure 23.1**

- 4 In reference to **Figure 23.1**, identify #1 - #5.

1 \_\_\_\_\_ 4 \_\_\_\_\_  
2 \_\_\_\_\_ 5 \_\_\_\_\_  
3 \_\_\_\_\_

## COVERINGS OF THE HEART

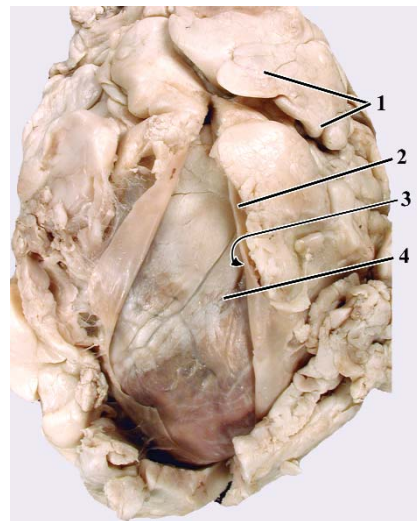
- 5 What is the name of the covering of the heart? \_\_\_\_\_
- 6 What is the function of the fibrous layer of the pericardium? \_\_\_\_\_
- 7 What is the name of the inner layer of the pericardium? \_\_\_\_\_
- 8 What is the name of the serous membrane on the surface of the heart? \_\_\_\_\_
- 9 What forms the pericardial cavity? \_\_\_\_\_
- 10 What is the function of the serous membrane? \_\_\_\_\_



**Figure 23.2**

- 11 In reference to **Figure 23.2**, identify #1 - #3.

1 \_\_\_\_\_ 3 \_\_\_\_\_  
2 \_\_\_\_\_



**Figure 23.3**

- 12 In reference to **Figure 23.3**, identify #1 - #4.

1 \_\_\_\_\_ 3 \_\_\_\_\_  
2 \_\_\_\_\_ 4 \_\_\_\_\_

## GROSS ANATOMY OF THE HEART

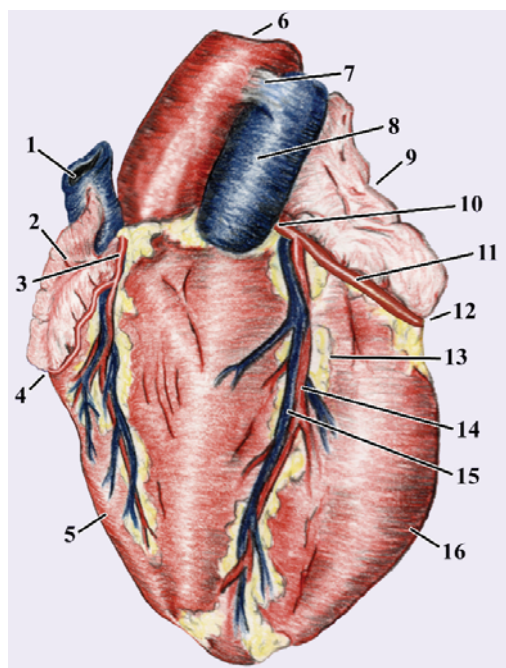
- 13 What is the name of the upper chambers of the heart? \_\_\_\_\_
- 14 What is the name of the lower chambers of the heart? \_\_\_\_\_
- 15 What divides the right and the left chambers of the heart? \_\_\_\_\_
- 16 What is the function of the right side of the heart? \_\_\_\_\_
- 17 What is the function of the left side of the heart? \_\_\_\_\_
- 18 What is the name of the muscle of the heart? \_\_\_\_\_
- 19 What is an auricle of the heart? \_\_\_\_\_
- 20 Which side of the heart is thicker? \_\_\_\_\_ Why? \_\_\_\_\_

## Valves of the Heart

- 21 Where are the atrioventricular valves located? \_\_\_\_\_
- 22 What are the names of the right and the left atrioventricular valves? \_\_\_\_\_
- 23 What is the function of the atrioventricular valves? \_\_\_\_\_
- 24 What is the name of the exiting vessel from the right ventricle? \_\_\_\_\_
- 25 What is the name of the exiting vessel from the left ventricle? \_\_\_\_\_
- 26 What is the name of the valve located at the base of each exiting vessel? \_\_\_\_\_

27 What is the function of the aortic and pulmonary valves?

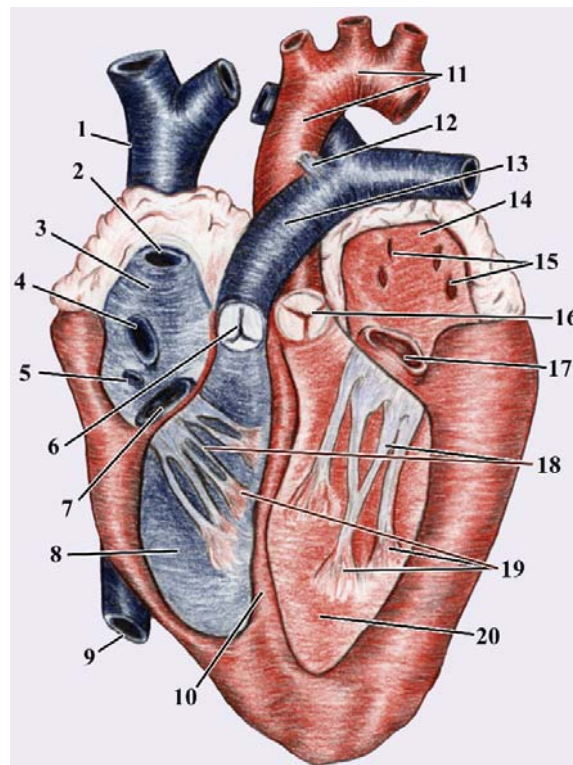
- |         |          |
|---------|----------|
| 1 _____ | 8 _____  |
| 2 _____ | 9 _____  |
| 3 _____ | 10 _____ |
| 4 _____ | 11 _____ |
| 5 _____ | 12 _____ |
| 6 _____ | 13 _____ |
| 7 _____ | 14 _____ |



**Figure 23.4**

28 In reference to **Figure 23.4**, identify #1 - #16.

- |         |          |
|---------|----------|
| 1 _____ | 9 _____  |
| 2 _____ | 10 _____ |
| 3 _____ | 11 _____ |
| 4 _____ | 12 _____ |
| 5 _____ | 13 _____ |
| 6 _____ | 14 _____ |
| 7 _____ | 15 _____ |
| 8 _____ | 16 _____ |

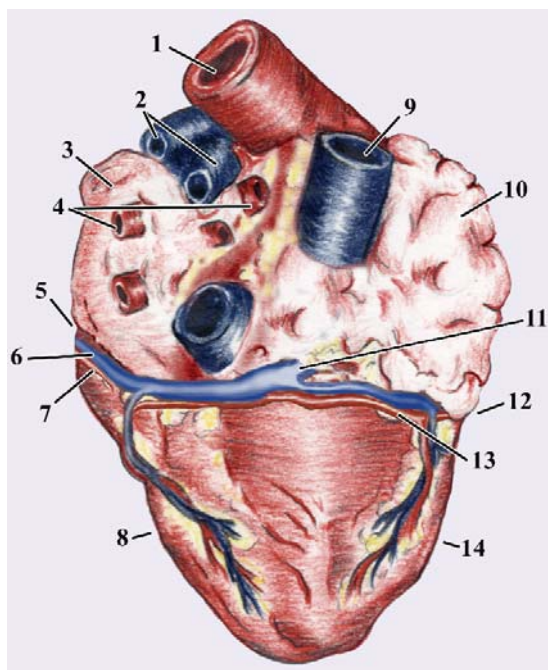


**Figure 23.6**

30 In reference to **Figure 23.6**, identify #1 - #20.

- |          |          |
|----------|----------|
| 1 _____  | 11 _____ |
| 2 _____  | 12 _____ |
| 3 _____  | 13 _____ |
| 4 _____  | 14 _____ |
| 5 _____  | 15 _____ |
| 6 _____  | 16 _____ |
| 7 _____  | 17 _____ |
| 8 _____  | 18 _____ |
| 9 _____  | 19 _____ |
| 10 _____ | 20 _____ |

- 31 The right atrium receives blood from \_\_\_\_\_
- 32 The superior vena cava returns blood from the \_\_\_\_\_
- 33 The inferior vena cava returns blood from the \_\_\_\_\_
- 34 The coronary sinus returns blood from the \_\_\_\_\_
- 35 What is the function of the tricuspid valve? \_\_\_\_\_
- 36 What is the function of the right ventricle? \_\_\_\_\_
- 37 What is the function of the pulmonary valve? \_\_\_\_\_



**Figure 23.5**

29 In reference to **Figure 23.5**, identify #1 - #14.

- 38 What is the function of the pulmonary trunk? \_\_\_\_\_
- 39 The left atrium receives blood from \_\_\_\_\_
- 40 The pulmonary veins carry \_\_\_\_\_
- 41 What is the function of the mitral (bicuspid) valve? \_\_\_\_\_
- 42 What is the function of the left ventricle? \_\_\_\_\_
- 43 What is the function of the aortic (semilunar) valve? \_\_\_\_\_
- 44 What vessel exits the heart to feed the systemic circuit? \_\_\_\_\_
- 45 What is the ligamentum arteriosum? \_\_\_\_\_
- 46 What are the chordae tendineae? \_\_\_\_\_
- 47 What are the papillary muscles? \_\_\_\_\_

### ROUTE OF BLOOD FLOW THROUGH THE HEART

#### Right Side of the Heart

- 48 Blood low in oxygen enters the right \_\_\_\_\_ from the \_\_\_\_\_ and \_\_\_\_\_ cavae and the \_\_\_\_\_.
- 49 Blood leaves the right atrium by way of the \_\_\_\_\_ and enters the \_\_\_\_\_.
- 50 Blood leaves the \_\_\_\_\_ by way of the \_\_\_\_\_ valve and enters the \_\_\_\_\_ trunk.
- 51 The pulmonary trunk directs blood into the \_\_\_\_\_ of the lungs for gas exchange.

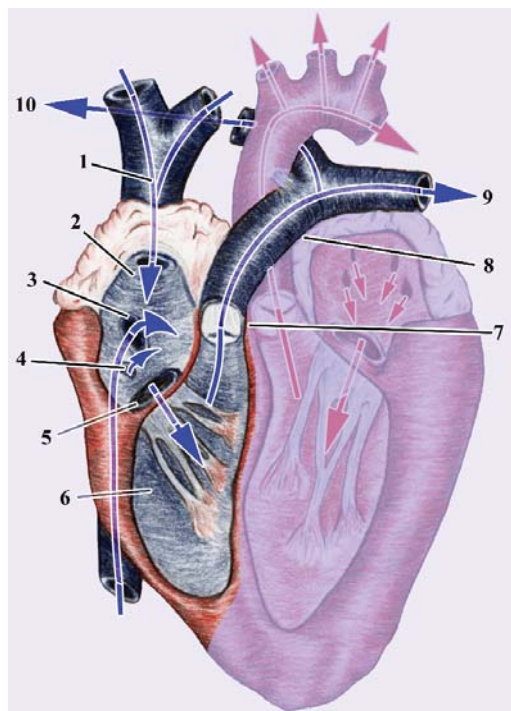


Figure 23.7

- 52 In reference to **Figure 23.7**, identify #1 - #10.

- |         |          |
|---------|----------|
| 1 _____ | 6 _____  |
| 2 _____ | 7 _____  |
| 3 _____ | 8 _____  |
| 4 _____ | 9 _____  |
| 5 _____ | 10 _____ |

#### Left Side of the Heart

- 53 Oxygen rich blood enters the left \_\_\_\_\_ from the \_\_\_\_\_ veins.
- 54 Blood leaves the left atrium by way of the \_\_\_\_\_ valve and enters the left \_\_\_\_\_.
- 55 Blood leaves the left ventricle by way of the \_\_\_\_\_ and enters the \_\_\_\_\_.
- 56 The aorta directs blood into the \_\_\_\_\_ of the body.

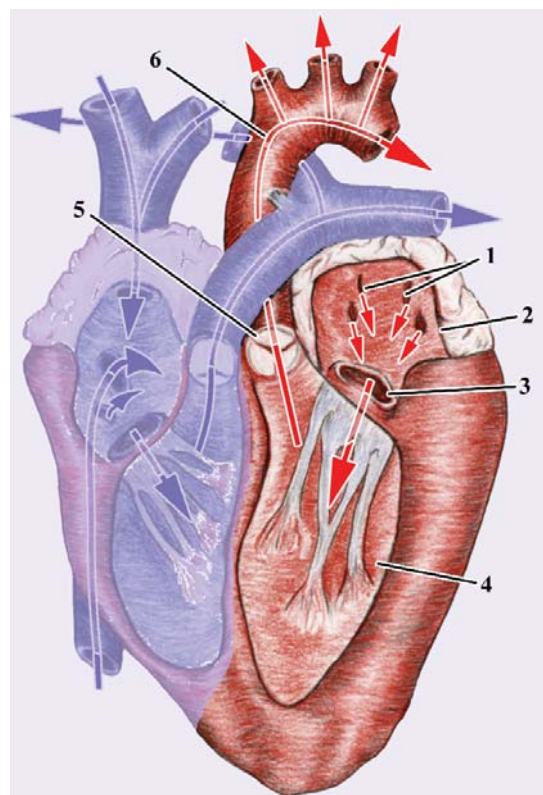


Figure 23.8

- 57 In reference to **Figure 23.8**, identify #1 - #6.

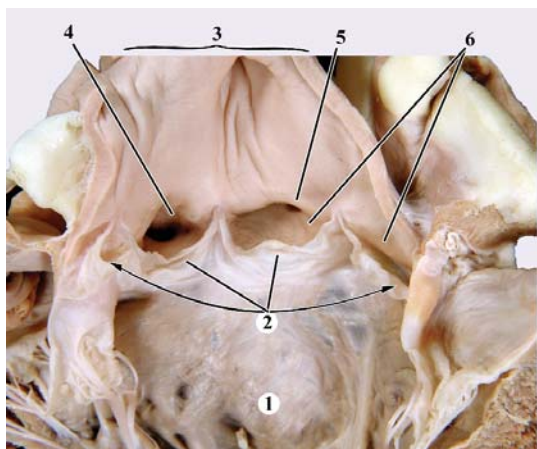
- |         |         |
|---------|---------|
| 1 _____ | 4 _____ |
| 2 _____ | 5 _____ |
| 3 _____ | 6 _____ |

### CORONARY CIRCULATION

#### CORONARY ARTERIES

- 58 Oxygen rich blood leaves the aorta and enters the two coronary arteries, the \_\_\_\_\_ arteries.
- 59 What are the aortic sinuses? \_\_\_\_\_
- 60 Which sinuses give rise to the coronary arteries? \_\_\_\_\_





**Figure 23.9**

61 In reference to **Figure 23.9**, identify #1 - #6.

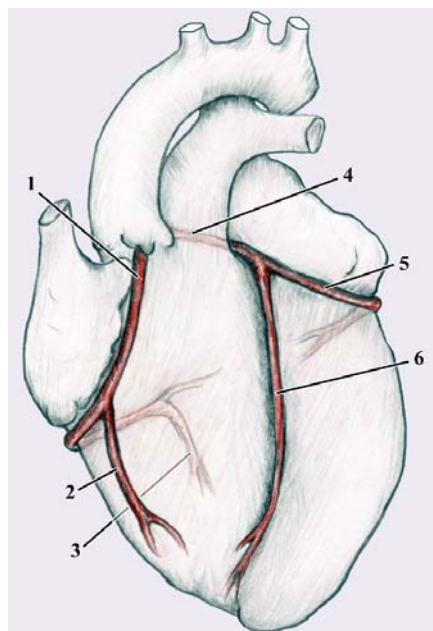
- |         |         |
|---------|---------|
| 1 _____ | 4 _____ |
| 2 _____ | 5 _____ |
| 3 _____ | 6 _____ |

### Right Coronary Artery

- 62 The right coronary artery follows the right \_\_\_\_\_ sulcus to the posterior \_\_\_\_\_ sulcus.
- 63 At the posterior interventricular sulcus, the right coronary artery continues as the \_\_\_\_\_.
- 64 At the margin of the right ventricle, a branch called the right \_\_\_\_\_ artery is formed from the right coronary artery.

### Left coronary artery

- 65 The left coronary artery branches into the \_\_\_\_\_ artery and the \_\_\_\_\_.



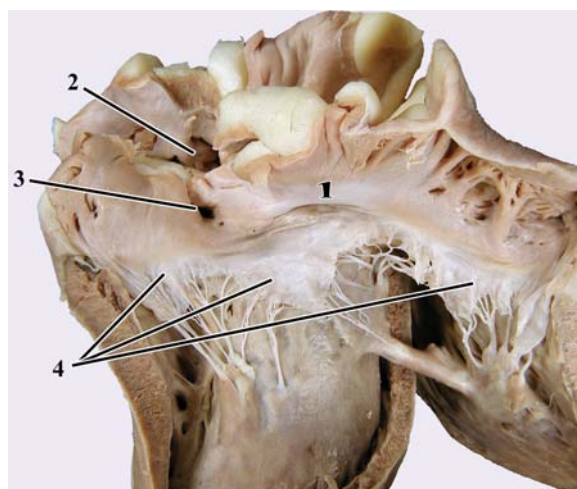
**Figure 23.10**

66 In reference to **Figure 23.10**, identify #1 - #6.

- |         |         |
|---------|---------|
| 1 _____ | 4 _____ |
| 2 _____ | 5 _____ |
| 3 _____ | 6 _____ |

### CORONARY VEINS

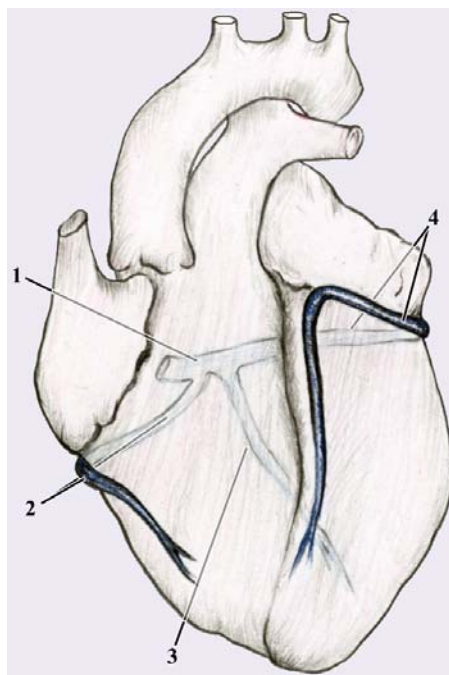
- 67 The three major veins that enter the coronary sinus are the:  
\_\_\_\_\_  
\_\_\_\_\_
- 68 What is the coronary sinus? \_\_\_\_\_  
\_\_\_\_\_



**Figure 23.11**

69 In reference to **Figure 23.11**, identify #1 - #4.

- |         |         |
|---------|---------|
| 1 _____ | 3 _____ |
| 2 _____ | 4 _____ |

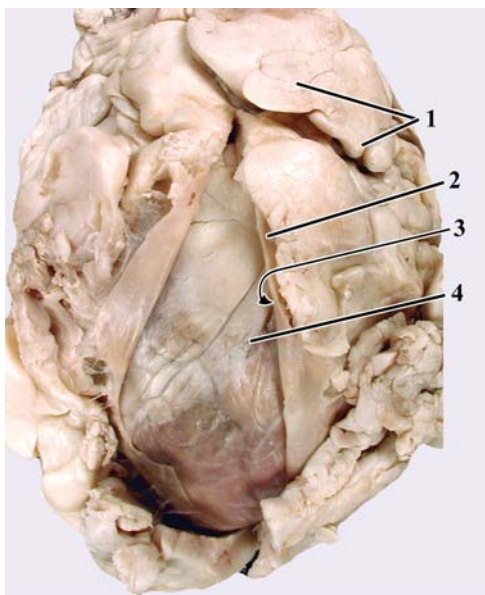


**Figure 23.12**

70 In reference to **Figure 23.12**, identify #1 - #4.

- |         |         |
|---------|---------|
| 1 _____ | 3 _____ |
| 2 _____ | 4 _____ |

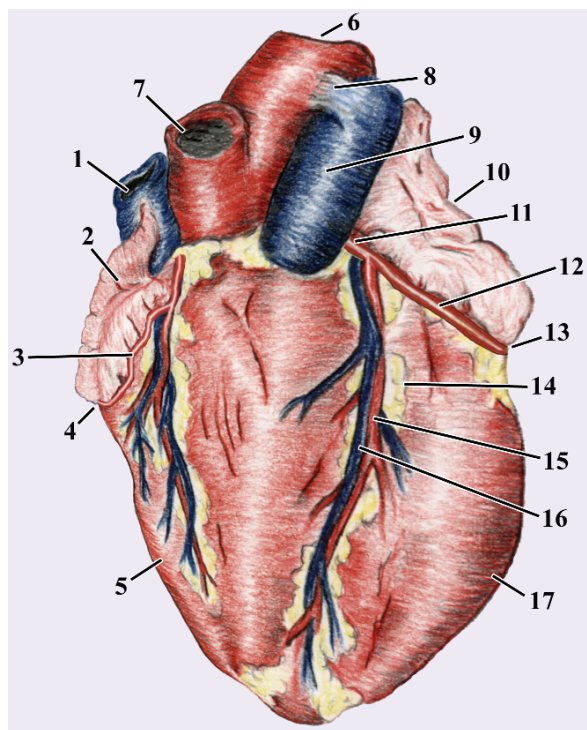
**SHEEP HEART DISSECTION**



**Figure 23.13**

71 In reference to **Figure 23.13**, identify #1 - #4.

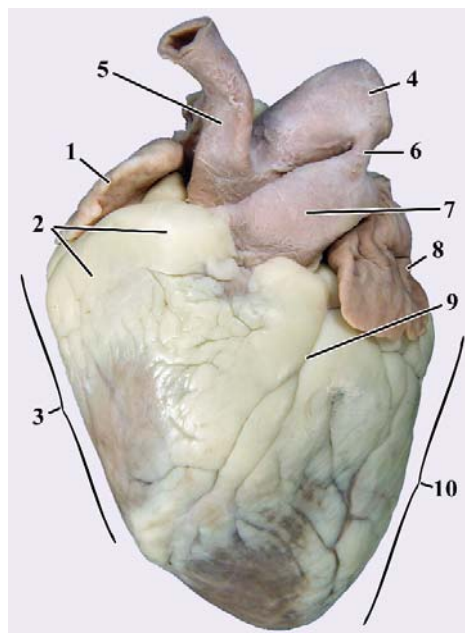
- |         |         |
|---------|---------|
| 1 _____ | 3 _____ |
| 2 _____ | 4 _____ |



**Figure 23.14**

72 In reference to **Figure 23.14**, identify #1 - #17.

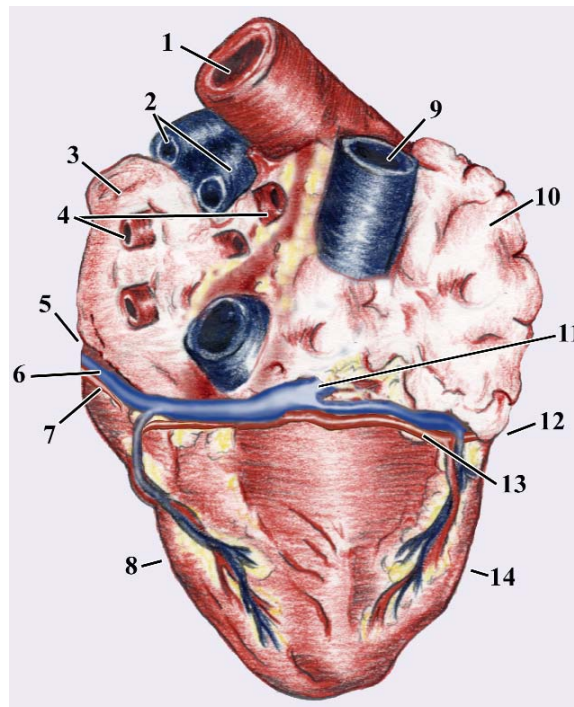
- |         |          |
|---------|----------|
| 1 _____ | 10 _____ |
| 2 _____ | 11 _____ |
| 3 _____ | 12 _____ |
| 4 _____ | 13 _____ |
| 5 _____ | 14 _____ |
| 6 _____ | 15 _____ |
| 7 _____ | 16 _____ |
| 8 _____ | 17 _____ |
| 9 _____ |          |



**Figure 23.15**

73 In reference to **Figure 23.15**, identify #1 - #10.

- |         |          |
|---------|----------|
| 1 _____ | 6 _____  |
| 2 _____ | 7 _____  |
| 3 _____ | 8 _____  |
| 4 _____ | 9 _____  |
| 5 _____ | 10 _____ |

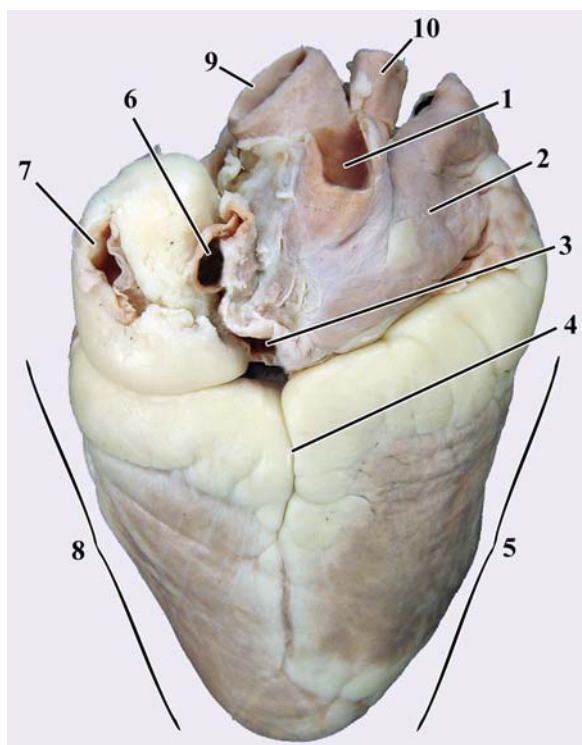


**Figure 23.16**

74 In reference to **Figure 23.16**, identify #1 - #14.

- |         |          |
|---------|----------|
| 1 _____ | 8 _____  |
| 2 _____ | 9 _____  |
| 3 _____ | 10 _____ |
| 4 _____ | 11 _____ |
| 5 _____ | 12 _____ |
| 6 _____ | 13 _____ |
| 7 _____ | 14 _____ |



**Figure 23.17**

76 In reference to **Figure 23.17**, identify #1 - #10.

- |         |          |
|---------|----------|
| 1 _____ | 6 _____  |
| 2 _____ | 7 _____  |
| 3 _____ | 8 _____  |
| 4 _____ | 9 _____  |
| 5 _____ | 10 _____ |

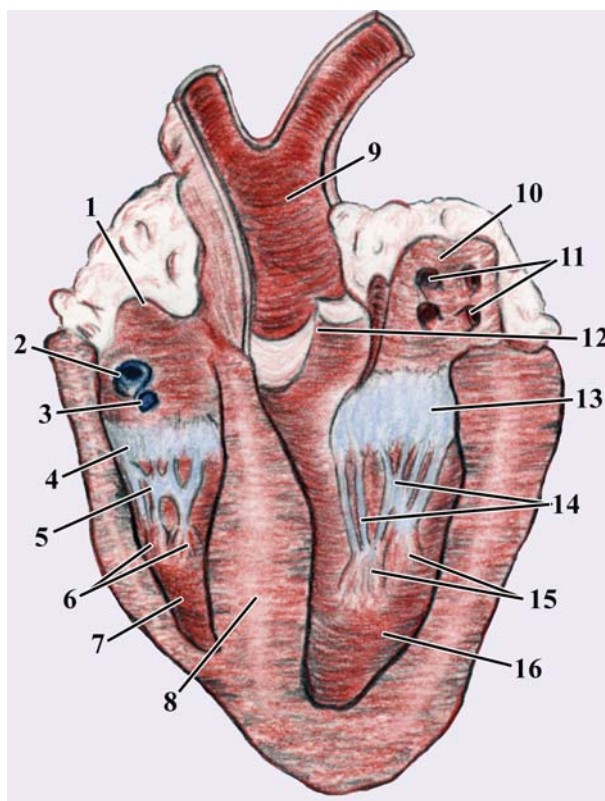
#### Pericardial sac, Epicardium, and Endocardium

- 76 What is the pericardium? \_\_\_\_\_
- 77 What is the inner layer of the pericardium? \_\_\_\_\_
- 78 What is the epicardium? \_\_\_\_\_
- 79 What is the myocardium? \_\_\_\_\_
- 80 What is the endocardium? \_\_\_\_\_
- 81 Internally, what does the interventricular sulcus follow? \_\_\_\_\_
- 82 Which side of the heart is more muscular? \_\_\_\_\_  
Why? \_\_\_\_\_

#### BLOOD VESSELS ASSOCIATED WITH THE HEART

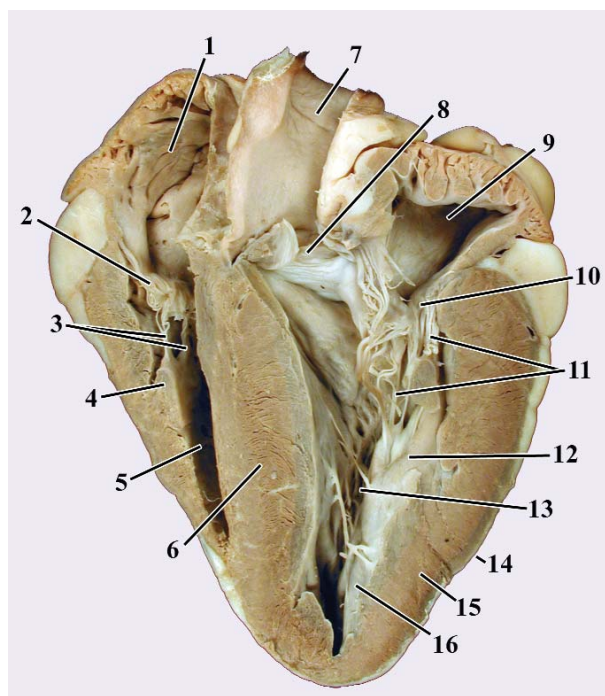
- 83 Do arteries or veins have thicker walls? \_\_\_\_\_ Why? \_\_\_\_\_
- 84 What is the function of the superior and inferior vena cavae? \_\_\_\_\_
- 85 Where is the pulmonary trunk located? \_\_\_\_\_
- 86 What is the function of the pulmonary trunk? \_\_\_\_\_
- 87 Where are the pulmonary veins located? \_\_\_\_\_
- 88 What is the function of the pulmonary veins? \_\_\_\_\_
- 89 Where is the aorta located? \_\_\_\_\_
- 90 What is the function of the aorta? \_\_\_\_\_

#### FRONTAL SECTION

**Figure 23.18**

91 In reference to **Figure 23.18**, identify #1 - #16.

- |         |          |
|---------|----------|
| 1 _____ | 9 _____  |
| 2 _____ | 10 _____ |
| 3 _____ | 11 _____ |
| 4 _____ | 12 _____ |
| 5 _____ | 13 _____ |
| 6 _____ | 14 _____ |
| 7 _____ | 15 _____ |
| 8 _____ | 16 _____ |

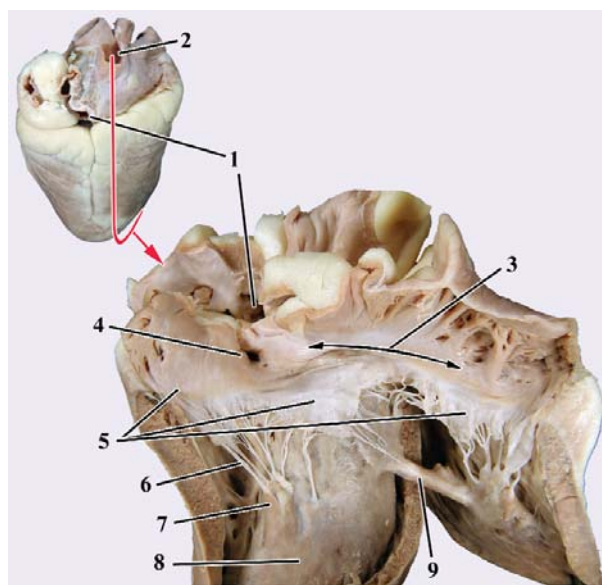


**Figure 23.19**

92 In reference to **Figure 23.19**, identify #1 - #16.

- |         |          |
|---------|----------|
| 1 _____ | 9 _____  |
| 2 _____ | 10 _____ |
| 3 _____ | 11 _____ |
| 4 _____ | 12 _____ |
| 5 _____ | 13 _____ |
| 6 _____ | 14 _____ |
| 7 _____ | 15 _____ |
| 8 _____ | 16 _____ |

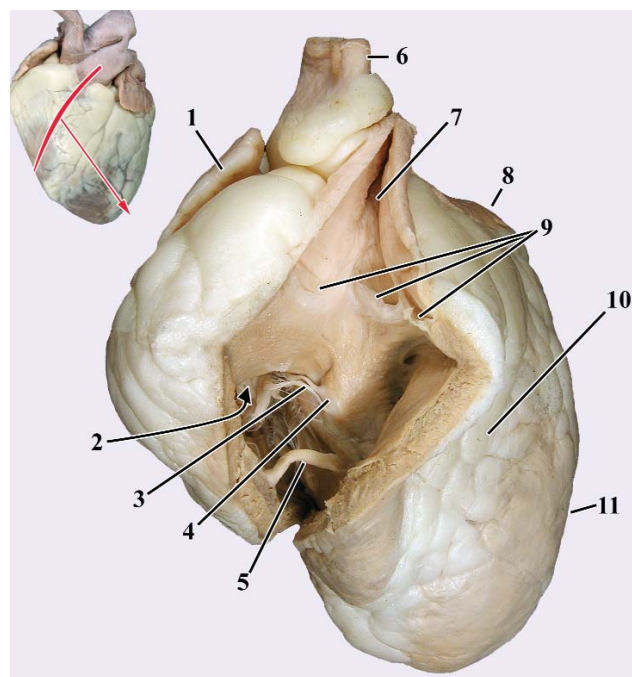
**DISSECTION OF RIGHT SIDE OF HEART**



**Figure 23.20**

93 In reference to **Figure 23.20**, identify #1 - #9.

- |         |         |
|---------|---------|
| 1 _____ | 6 _____ |
| 2 _____ | 7 _____ |
| 3 _____ | 8 _____ |
| 4 _____ | 9 _____ |
| 5 _____ |         |



**Figure 23.21**

94 In reference to **Figure 23.21**, identify #1 - #11.

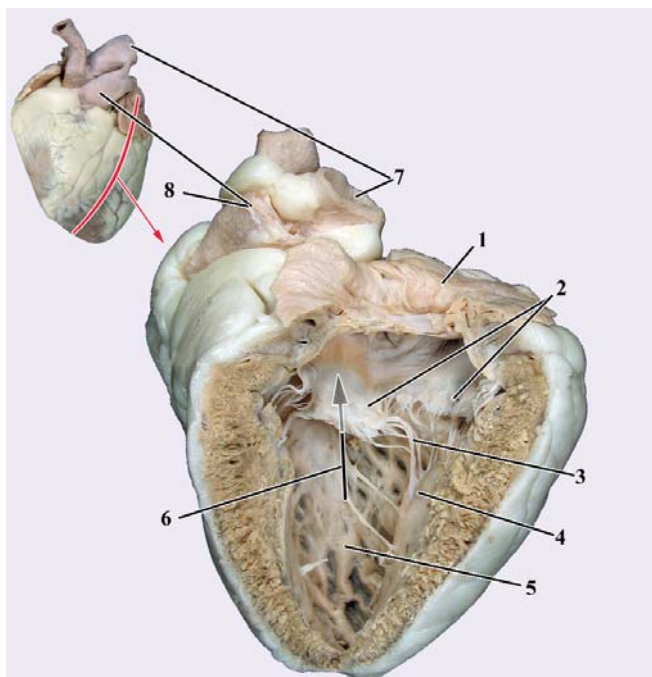
- |         |          |
|---------|----------|
| 1 _____ | 7 _____  |
| 2 _____ | 8 _____  |
| 3 _____ | 9 _____  |
| 4 _____ | 10 _____ |
| 5 _____ | 11 _____ |
| 6 _____ |          |

- 95 What is attached to the free-edges of the cusps of the tricuspid valve? \_\_\_\_\_
- 96 The chordae tendineae attached to the myocardium at modified sites called \_\_\_\_\_ muscles.
- 97 When does the tricuspid valve close? \_\_\_\_\_
- 98 What prevents the cusps from moving into the atrium? \_\_\_\_\_
- 99 What is the function of the moderator band? \_\_\_\_\_
- 100 Where is the pulmonary (semilunar) valve located? \_\_\_\_\_
- 101 When does the pulmonary (semilunar) valve open? \_\_\_\_\_
- 102 What is the function of the pulmonary valve? \_\_\_\_\_
- 103 When does the pulmonary valve close? \_\_\_\_\_
- 104 Where is blood in the pulmonary trunk directed? \_\_\_\_\_



DISSECTION OF THE LEFT SIDE OF HEART

3



**Figure 23.22**

105 In reference to **Figure 23.22**, identify #1 - #8.

- |         |         |
|---------|---------|
| 1 _____ | 5 _____ |
| 2 _____ | 6 _____ |
| 3 _____ | 7 _____ |
| 4 _____ | 8 _____ |

106 What is attached to the free-edges of the cusps of the bicuspid valve? \_\_\_\_\_

107 The chordae tendineae attached to the myocardium at modified sites called \_\_\_\_\_ muscles.

108 When does the mitral valve close? \_\_\_\_\_

109 What is the function of the chordae tendineae and papillary muscles? \_\_\_\_\_

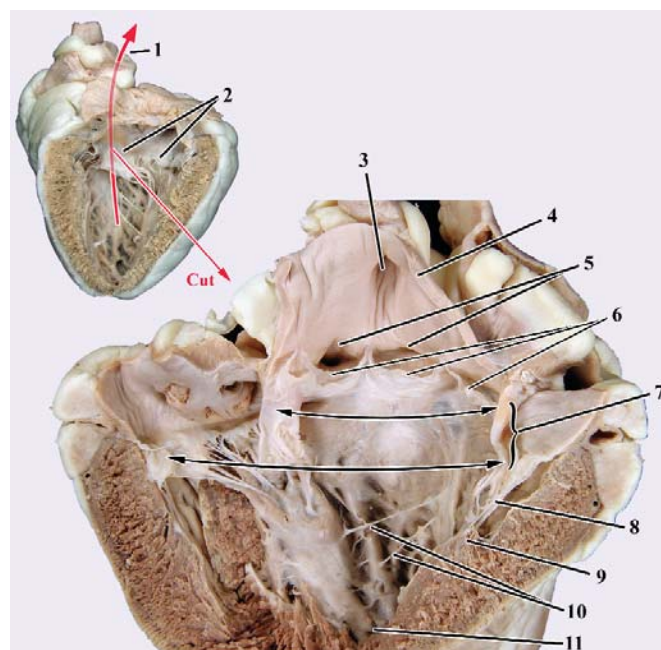
110 Where is the aortic (semilunar) valve located? \_\_\_\_\_

111 When does the aortic (semilunar) valve open? \_\_\_\_\_

112 What is the function of the aortic valve? \_\_\_\_\_

113 When does the aortic valve close? \_\_\_\_\_

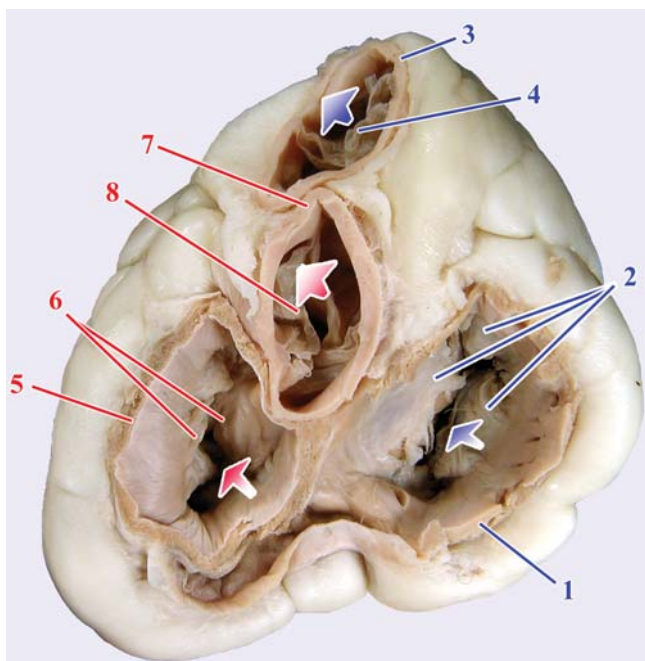
114 Where is blood in the aorta trunk directed? \_\_\_\_\_



**Figure 23.23**

115 In reference to **Figure 23.23**, identify #1 - #11.

- |         |          |
|---------|----------|
| 1 _____ | 7 _____  |
| 2 _____ | 8 _____  |
| 3 _____ | 9 _____  |
| 4 _____ | 10 _____ |
| 5 _____ | 11 _____ |
| 6 _____ |          |



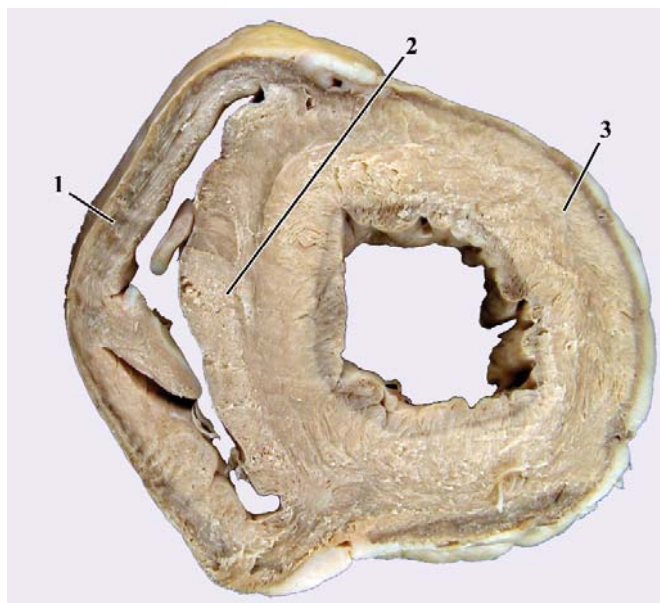
**Figure 23.24**

116 In reference to **Figure 23.24**, identify #1 - #8.

- |         |         |
|---------|---------|
| 1 _____ | 5 _____ |
| 2 _____ | 6 _____ |
| 3 _____ | 7 _____ |
| 4 _____ | 8 _____ |



- 117 What causes the opening and closing of the valves of the heart? \_\_\_\_\_
- 118 The free-edges of the atrioventricular valves point into the \_\_\_\_\_.
- 119 When are the atrioventricular valves open? \_\_\_\_\_
- 120 When are the atrioventricular valves closed? \_\_\_\_\_
- 121 As one-way valves, the atrioventricular valves prevent the back flow of blood into the \_\_\_\_\_.
- 122 What is atrioventricular valve prolapse? \_\_\_\_\_
- 123 Which of the two atrioventricular valves is mostly involved in prolapse? \_\_\_\_\_
- 124 The free-edges of the pulmonary and aortic valves point into the \_\_\_\_\_.
- 125 When are the pulmonary and aortic valves open? \_\_\_\_\_
- 126 When are the pulmonary and aortic valves closed? \_\_\_\_\_
- 127 As one-way valves, the pulmonary and aortic valves prevent the back flow of blood into the \_\_\_\_\_.
- VENTRICULAR WALLS**
- 128 Which ventricle has the thickest wall? \_\_\_\_\_
- 129 Do the right and left ventricles normally pump the same volume of blood? \_\_\_\_\_



**Figure 23.25**

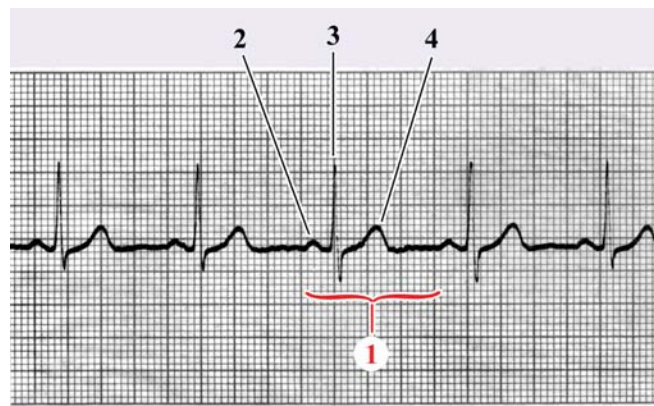
- 130 In reference to **Figure 23.25**, identify #1 - #3.

1 \_\_\_\_\_ 3 \_\_\_\_\_  
2 \_\_\_\_\_

## ELECTRICAL EVENTS OF THE HEART

### Electrocardiogram

- 131 What is an electrocardiogram? \_\_\_\_\_
- 132 How many leads are normally used in a diagnostic ECG? \_\_\_\_\_



**Figure 23.26**

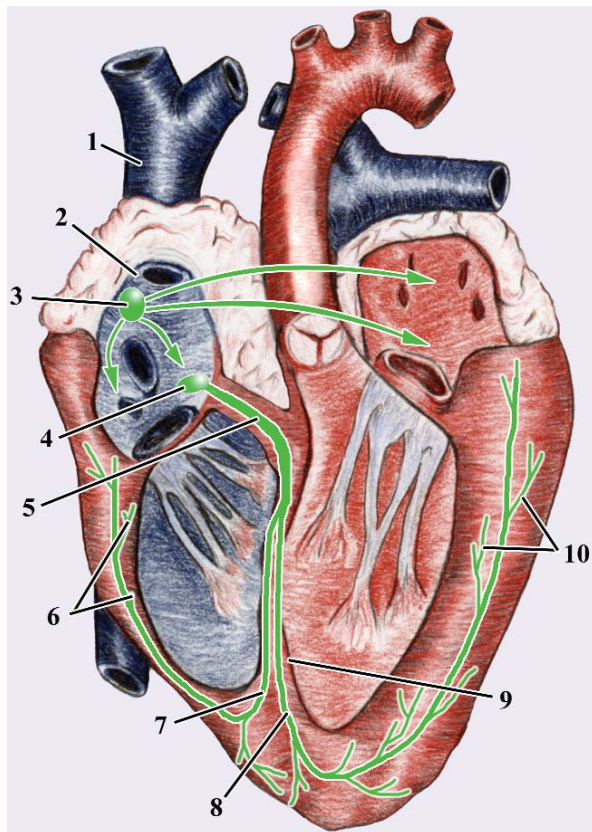
- 133 In reference to **Figure 23.26**, identify #1 - #4.

1 \_\_\_\_\_ 3 \_\_\_\_\_  
2 \_\_\_\_\_ 4 \_\_\_\_\_

### Conduction System of the Heart

- 134 Where is the sinoatrial node (SA node) located? \_\_\_\_\_
- 135 What is the function of the SA node? \_\_\_\_\_
- 136 What is a cardiac cycle? \_\_\_\_\_
- 137 What depolarizes after the SA node? \_\_\_\_\_
- 138 What results from atrial depolarization? \_\_\_\_\_
- 139 Where is the atrioventricular (AV) node located? \_\_\_\_\_
- 140 When does the AV node depolarize? \_\_\_\_\_
- 141 From the AV node list in sequence the structures that depolarize. \_\_\_\_\_
- 142 What is the result of the depolarization of the ventricular myocardium? \_\_\_\_\_

3



**Figure 23.27**

143 In reference to **Figure 23.27**, identify #1 - #10.

- |         |          |
|---------|----------|
| 1 _____ | 6 _____  |
| 2 _____ | 7 _____  |
| 3 _____ | 8 _____  |
| 4 _____ | 9 _____  |
| 5 _____ | 10 _____ |

#### ECG Waves

144 What are three distinctive waves of a normal ECG? \_\_\_\_\_

145 When does the P wave begin, and what does it represent? \_\_\_\_\_

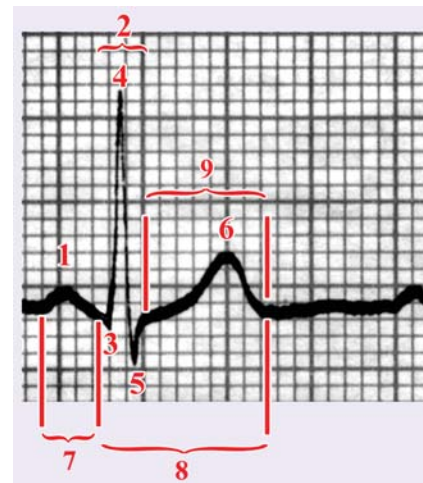
146 What does the QRS complex represent? \_\_\_\_\_

147 What does the T wave represent? \_\_\_\_\_

148 What is the P-Q interval? \_\_\_\_\_

149 What is the Q-T interval? \_\_\_\_\_

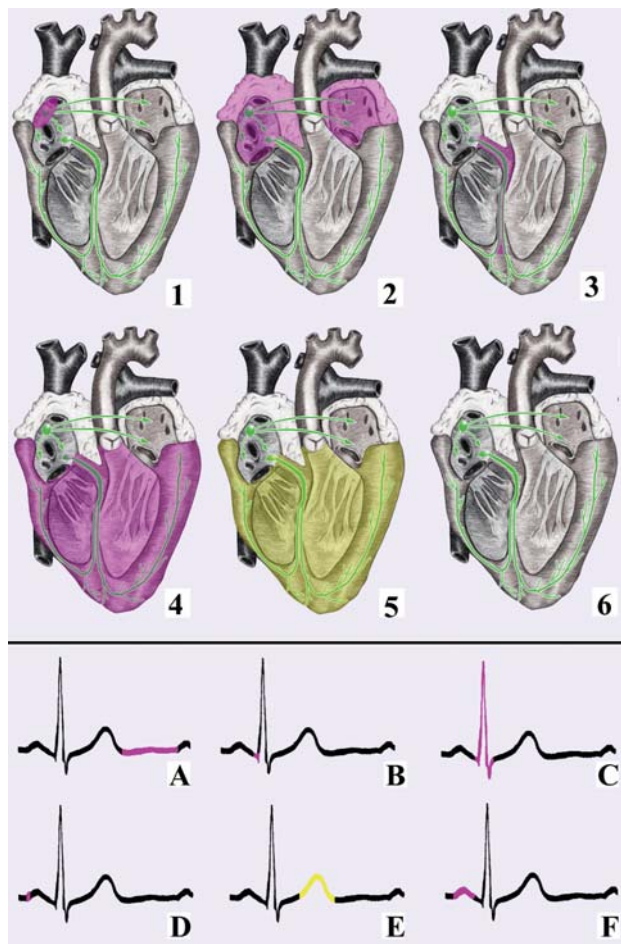
150 What is the S-T segment? \_\_\_\_\_



**Figure 23.28**

151 In reference to **Figure 23.28**, identify #1 - #9.

- |         |         |
|---------|---------|
| 1 _____ | 6 _____ |
| 2 _____ | 7 _____ |
| 3 _____ | 8 _____ |
| 4 _____ | 9 _____ |
| 5 _____ |         |



**Figure 23.29**

152 Match the numbers of the heart illustrations with their ECG tracing (A - F).

- |         |         |
|---------|---------|
| 1 _____ | 4 _____ |
| 2 _____ | 5 _____ |
| 3 _____ | 6 _____ |



### CARDIAC CYCLE

- 153 What characterizes a normal sinus rhythm? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
- 154 The average heart rate is \_\_\_\_\_ beats per minute, taking \_\_\_\_\_ second per beat.
- 155 During the end of the previous cardiac cycle (following T wave) the heart is in its \_\_\_\_\_ period.
- 156 During the resting period both the atria and the ventricles are \_\_\_\_\_ with blood.
- 157 During the resting period the atrioventricular valves are \_\_\_\_\_ and the semilunar valves are \_\_\_\_\_.
- 158 Atrial depolarization, shown on the ECG by the \_\_\_\_\_ wave, results in atrial \_\_\_\_\_.
- 159 How long is atria systole? \_\_\_\_\_  
\_\_\_\_\_
- 160 How long is atrial diastole? \_\_\_\_\_  
\_\_\_\_\_
- 161 The QRS complex represents the \_\_\_\_\_ of the ventricles and results in ventricular \_\_\_\_\_.
- 162 The atrioventricular valves close when pressure in the ventricles is \_\_\_\_\_ than pressure in the atria, and produces the \_\_\_\_\_.
- 163 The pulmonary and aortic valves open when pressure in the ventricles is \_\_\_\_\_ than pressure in the pulmonary trunk and aorta.
- 164 Blood ejection causes the elastic arteries to \_\_\_\_\_ to accommodate the increased blood volume.
- 165 The T wave represents ventricular \_\_\_\_\_ and results in ventricular \_\_\_\_\_.
- 166 The pulmonary and aortic valves close when ventricular pressure is \_\_\_\_\_ than pressure in the pulmonary trunk and aorta, and produces the \_\_\_\_\_.
- 167 When ventricular pressure is \_\_\_\_\_ than atrial pressure, the atrioventricular valves \_\_\_\_\_.
- 168 The elastic arteries \_\_\_\_\_ and provide the force to continue driving blood through the circulatory system.
- 169 The expansion and recoil of the elastic arteries are described as the \_\_\_\_\_.

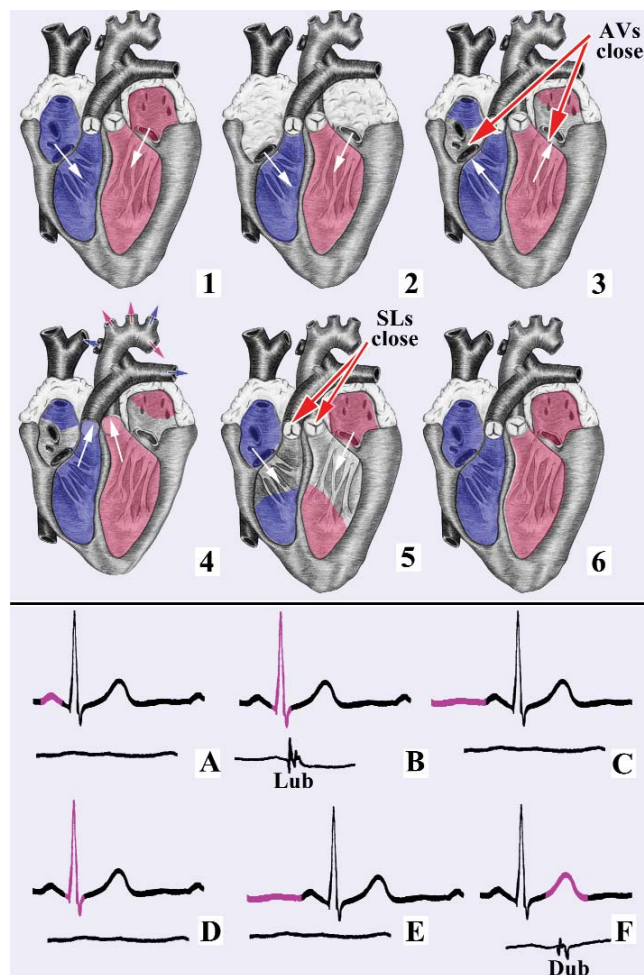


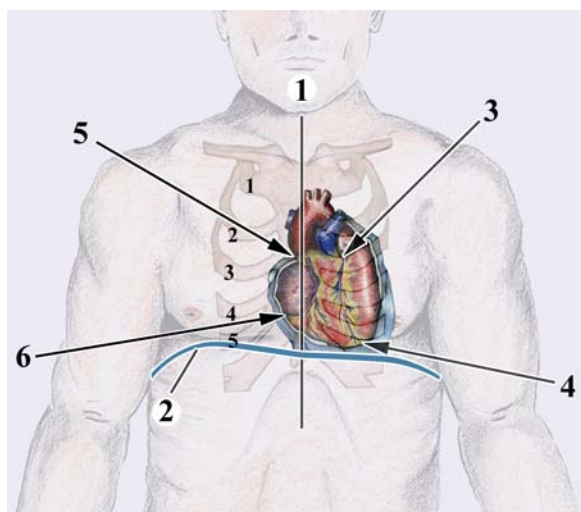
Figure 23.30

- 170 Match the numbers of the heart illustrations showing blood flow with their ECG and heart sound tracings (A - F).

- |         |         |
|---------|---------|
| 1 _____ | 4 _____ |
| 2 _____ | 5 _____ |
| 3 _____ | 6 _____ |

### AUSCULTATION OF HEART

- 171 What is auscultation? \_\_\_\_\_  
\_\_\_\_\_
- 172 What site is the best site for auscultation of the aortic semilunar valve? \_\_\_\_\_  
\_\_\_\_\_
- 173 What site is the best site for auscultation of the pulmonary semilunar valve? \_\_\_\_\_  
\_\_\_\_\_
- 174 What site is the best site for auscultation of the mitral (bicuspid) valve? \_\_\_\_\_  
\_\_\_\_\_
- 175 What site is the best site for auscultation of the tricuspid valve? \_\_\_\_\_  
\_\_\_\_\_



**Figure 23.31**

176 In reference to **Figure 23.31**, identify #1 - #6.

- |         |         |
|---------|---------|
| 1 _____ | 4 _____ |
| 2 _____ | 5 _____ |
| 3 _____ | 6 _____ |

### CARDIAC MUSCLE

177 What are several characteristics of cardiac muscle fibers?

\_\_\_\_\_

178 The T tubes of cardiac muscle are \_\_\_\_\_, and cardiac muscle does not have \_\_\_\_\_.

179 Contraction of cardiac muscle is dependent upon the presence of \_\_\_\_\_ ions.

180 Calcium ions are delivered from the \_\_\_\_\_ and the \_\_\_\_\_ environment.

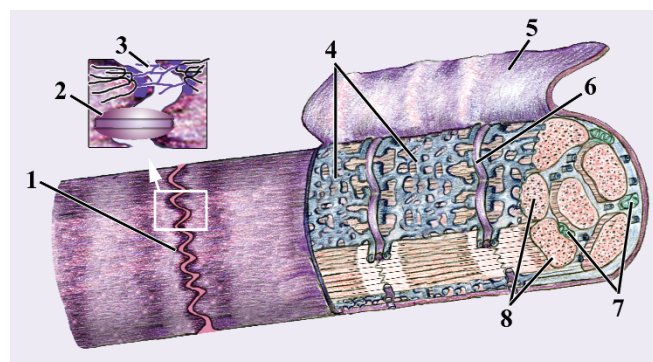
181 Contraction is terminated by the removal of \_\_\_\_\_ ions.

182 Intercalated discs contain \_\_\_\_\_ junctions and \_\_\_\_\_.

183 Gap junctions function as \_\_\_\_\_.

184 Desmosomes function in providing \_\_\_\_\_.

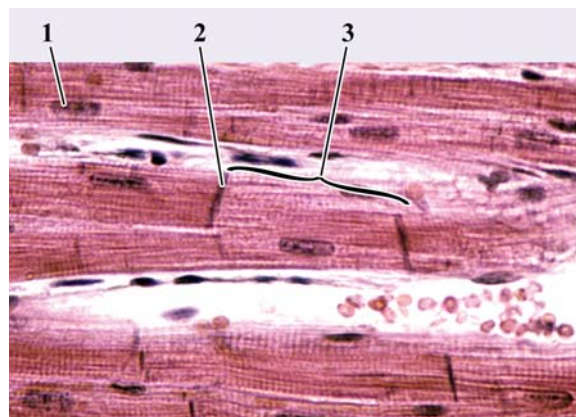
185 The pacemaker, or sinoatrial node, is controlled by the \_\_\_\_\_.



**Figure 23.32**

186 In reference to **Figure 23.32**, identify #1 - #8.

- |         |         |
|---------|---------|
| 1 _____ | 5 _____ |
| 2 _____ | 6 _____ |
| 3 _____ | 7 _____ |
| 4 _____ | 8 _____ |



**Figure 23.33**

187 In reference to **Figure 23.33**, identify #1 - #3.

- |         |         |
|---------|---------|
| 1 _____ | 3 _____ |
| 2 _____ |         |

### CARDIAC MUSCLE CELLS - ACTION POTENTIAL

188 The cardiac action potential is divided into three segments,

\_\_\_\_\_

189 The segment of rapid depolarization is due to the opening of \_\_\_\_\_ channels.

190 The segment of rapid depolarization results in the beginning of muscle \_\_\_\_\_.

191 The segment of slow depolarization is due to the opening of \_\_\_\_\_ channels.

192 During the segment of slow depolarization, cross-bridge activation \_\_\_\_\_ producing increased tension.

193 The segment of repolarization is due to the opening of \_\_\_\_\_.

194 During the segment of repolarization, the sarcolemma is returned to its resting potential by the \_\_\_\_\_.

\_\_\_\_\_



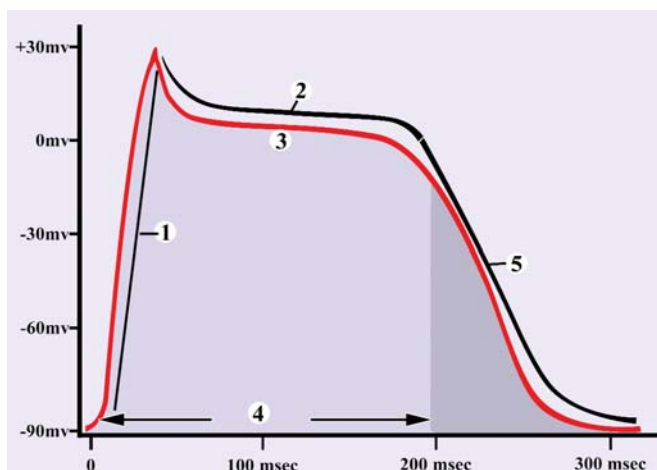


Figure 23.34

195 In reference to **Figure 23.34**, identify #1 - #5.

- 1 \_\_\_\_\_
- 2 \_\_\_\_\_
- 3 \_\_\_\_\_
- 4 \_\_\_\_\_
- 5 \_\_\_\_\_

### CARDIAC CONDUCTION FIBERS

196 What are some of the conduction pathways? \_\_\_\_\_

197 What is the function of conduction pathways? \_\_\_\_\_

198 What are Purkinje fibers? \_\_\_\_\_

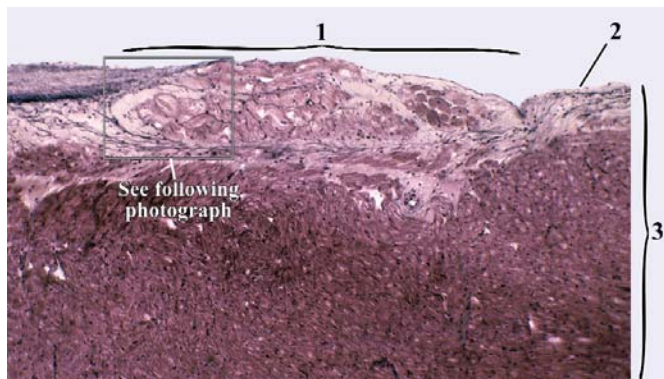


Figure 23.35

199 In reference to **Figure 23.35**, identify #1 - #3.

- 1 \_\_\_\_\_ 3 \_\_\_\_\_
- 2 \_\_\_\_\_

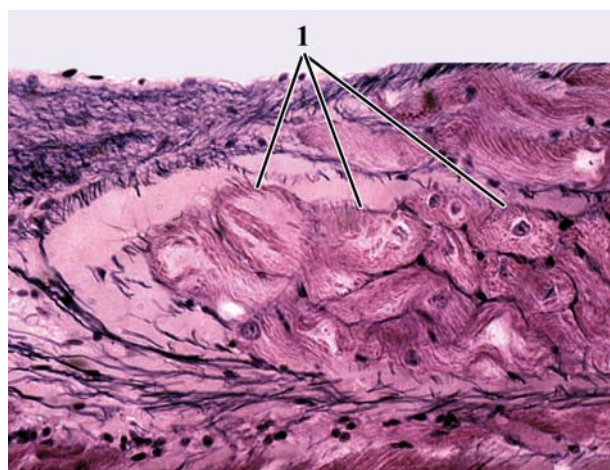


Figure 23.36

200 In reference to **Figure 23.36**, identify #1.

- 1 \_\_\_\_\_

### CARDIAC OUTPUT

201 What is cardiac output? \_\_\_\_\_

202 How is cardiac output calculated? \_\_\_\_\_

### STROKE VOLUME

203 What is stroke volume? \_\_\_\_\_

204 How is stroke volume calculated? \_\_\_\_\_

205 What is end diastolic volume? \_\_\_\_\_

206 What is end systolic volume? \_\_\_\_\_

### Changes affecting the End Diastolic Volume

207 What are two factors that affect the end diastolic volume? \_\_\_\_\_

208 How does fill time affect the end diastolic volume? \_\_\_\_\_

209 How does venous return affect the end diastolic volume? \_\_\_\_\_

**Changes affecting the End Systolic Volume**

210 What are three factors that influence the end systolic volume? \_\_\_\_\_

211 What is preload? \_\_\_\_\_

212 Stretching of the myocardium (within limits) produces a \_\_\_\_\_ alignment between the thin filaments and the thick filaments.

213 According to \_\_\_\_\_ law of the heart (more / less) blood is ejected when the myocardium is stretched.

214 What is contractility? \_\_\_\_\_

215 What are three factors that affect contractility? \_\_\_\_\_

216 What is afterload? \_\_\_\_\_

217 What determines afterload? \_\_\_\_\_

218 The greater the pressure in the exiting vessels of the ventricles, the \_\_\_\_\_ the afterload.

219 What is the primary factor that influences afterload? \_\_\_\_\_

**HEART RATE**

220 Heart rate is primarily controlled by the \_\_\_\_\_.

221 The parasympathetic division \_\_\_\_\_ heart rate.

222 The sympathetic division \_\_\_\_\_ heart rate.

223 In addition to the ANS other factors that influence heart rate are \_\_\_\_\_

224 The normal range for the heart rate is \_\_\_\_\_, with most people averaging \_\_\_\_\_.

225 Bradycardia is \_\_\_\_\_

226 Tachycardia is \_\_\_\_\_