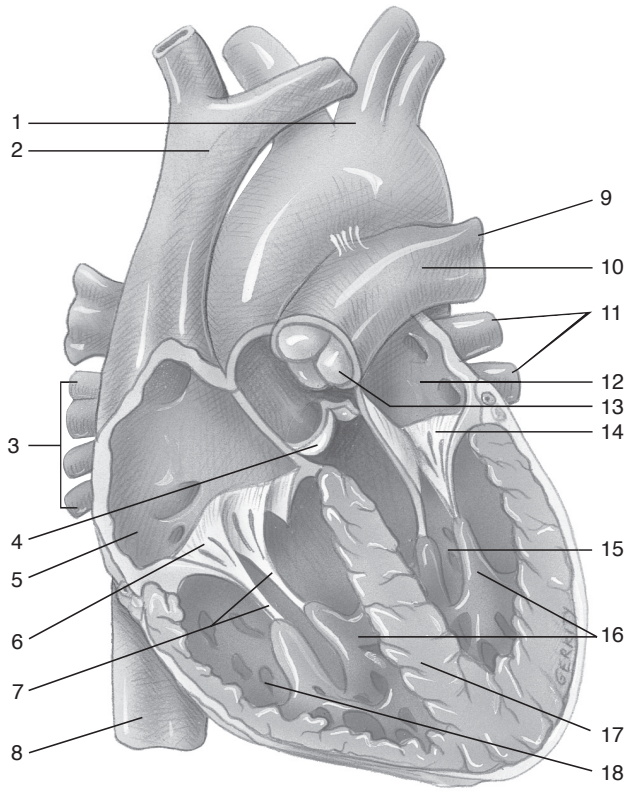
1. Structure of the Heart

a. Write the correct labels in the spaces at the right.



1) **Aorta**
2) **Superior vena cava**
3) **Rt. pulmonary veins**
4) **Aortic semilunar valve**
5) **Right atrium**
6) **Tricuspid valve**
7) **Chordae tendineae**
8) **Inferior vena cava**
9) **Left pulmonary artery**
10) **Pulmonary trunk**
11) **Left pulmonary veins**
12) **Left atrium**
13) **Pulmonary semilunar valve**
14) **Mitral (bicuspid) valve**
15) **Left ventricle**
16) **Papillary muscle**
17) **Ventricular septum**
18) **Right ventricle**

b. Write the answers that match the statements in the spaces at the right.

1) Receives blood from venae cavae. **Right atrium**
2) Receives blood from pulmonary veins. **Left atrium**
3) Separates ventricles. **Ventricular septum**
4) Prevents backflow of blood from right ventricle into right atrium. **Tricuspid valve**
5) Prevents backflow of blood from left ventricle into left atrium. **Bicuspid valve**
6) Prevents backflow of blood from aorta into left ventricle. **Aortic semilunar valve**
7) Prevents backflow of blood from pulmonary trunk into right ventricle. **Pulmonary semilunar valve**
8) Restrain cusps of A-V valves. **Chordae tendineae**
9) Pumps blood into pulmonary trunk. **Right ventricle**
10) Pumps blood into aorta. **Left ventricle**

2. Cardiac Cycle

Write the answers that match the statements in the spaces at the right.

1) Contraction phase of the ventricles. **Ventricular systole**
2) Relaxation phase of the ventricles. **Ventricular diastole**
3) Valves closing to produce first heart sound. **AV valves**
4) Valves closing to produce second heart sound. **Semilunar valves**
5) Valves open during ventricular systole. **Semilunar valves**
6) Valves closed during ventricular systole. **AV valves**
7) Valves open during ventricular diastole. **AV valves**
8) Valves closed during ventricular diastole. **Semilunar valves**

3. Heart Conduction System and Electrocardiogram

Write the answers that match the statements in the spaces at the right.

1) Small fibers carrying impulses to myocardium. **Purkinje fibers**
2) Pacemaker of the heart. **S-A node**
3) Thick fibers extending from A-V node. **A-V bundle**
4) Transmits impulses to atria and A-V node. **S-A node**
5) Transmits impulses to A-V bundle. **A-V node**
6) Wave caused by depolarization of ventricles. **QRS wave**
7) Wave caused by repolarization of ventricles. **T wave**
8) Wave caused by depolarization of atria. **P wave**

4. Regulation of Heart Rate

a. Write the answers that match the statements in the spaces at the right.

1) Autonomic center controlling heart rate. **Cardiac control center**
2) ANS division whose impulses increase heart rate. **Sympathetic**
3) ANS division whose impulses decrease heart rate. **Parasympathetic**
4) Gender with faster heart rate. **Female**
5) Nerve carrying parasympathetic fibers to the heart. **Vagus nerve**

b. Match the effect on heart rate with the factors listed.

1) Increases	2) Decreases	3) No effect
__1__ Epinephrine	__2__ Excess K^+	__2__ Insufficient Ca^{++}
__2__ Old age	__2__ Acetylcholine	__1__ Excitement
__1__ Fever	__1__ Anxiety	__1__ Thyroxine
__2__ Physical conditioning	__3__ Increase in blood pressure	__1__ Norepinephrine

5. Types of Blood Vessels

Write the answers that match the statements in the spaces at the right.

1) Composed of endothelium only. **Capillaries**
2) Vessels with thickest walls. **Arteries**
3) Vessels with valves. **Veins**
4) Carry blood from capillaries to heart. **Veins**
5) Carry blood from heart to capillaries. **Arteries**
6) Vessels exchanging materials with tissues. **Capillaries**
7) Smallest and most numerous vessels. **Capillaries**

6. Blood Flow and Blood Pressure

a. Write the answers that match the statements in the spaces at the right.

1) Systemic vessel with fastest blood flow. **Aorta**
2) Vessels with slowest blood flow. **Capillaries**
3) Systemic vessel with greatest blood pressure. **Aorta**
4) Primary force moving blood. **Blood pressure**
5) Two additional forces that help return venous blood to the heart. **Skeletal muscle contractions**; **Respiratory movements**
6) Normal systolic blood pressure. **120± 10 mm Hg**
7) Normal diastolic blood pressure. **80± 10 mm Hg**
8) Autonomic center controlling diameter of blood vessels. **Vasomotor center**
9) Systolic pressure minus diastolic pressure. **Pulse pressure**
10) Effect on precapillary sphincters by a local decrease in oxygen and pH. **Dilation (open)**
11) Effect on precapillary sphincters by sympathetic impulses. **Vasoconstriction**

b. Indicate whether the following conditions cause an *increase* (+) or *decrease* (−) in blood pressure.

__+__ An increase in peripheral resistance.
__−__ A marked decrease in blood volume.
__−__ A decrease in cardiac output.
__−__ Dilation of a great many arterioles.
__+__ A significant increase in plasma proteins.
__+__ Sympathetic impulses to arterioles.
__+__ Constriction of most arterioles.
__+__ An increase in heart rate.

7. Circulation Pathways

Trace the pathway of blood from a ventricle of the heart to the organ indicated and back to an atrium of the heart. Write the names of the correct heart chambers, arteries, and veins in the blanks.

1) Right little finger.

Left ventricle → **Aorta a.** → **Brachiocephalic a.** → **Rt. Subclavian a.** → **Rt. Axillary a.** → **Rt. Brachial a.** → **Rt. Ulnar a.** → right little finger → **Rt. Basilic v.** → **Rt. Axillary v.** → **Rt. Subclavian v.** → **Rt. Brachiocephalic v.** → **Superior vena cava** → **Right** atrium.

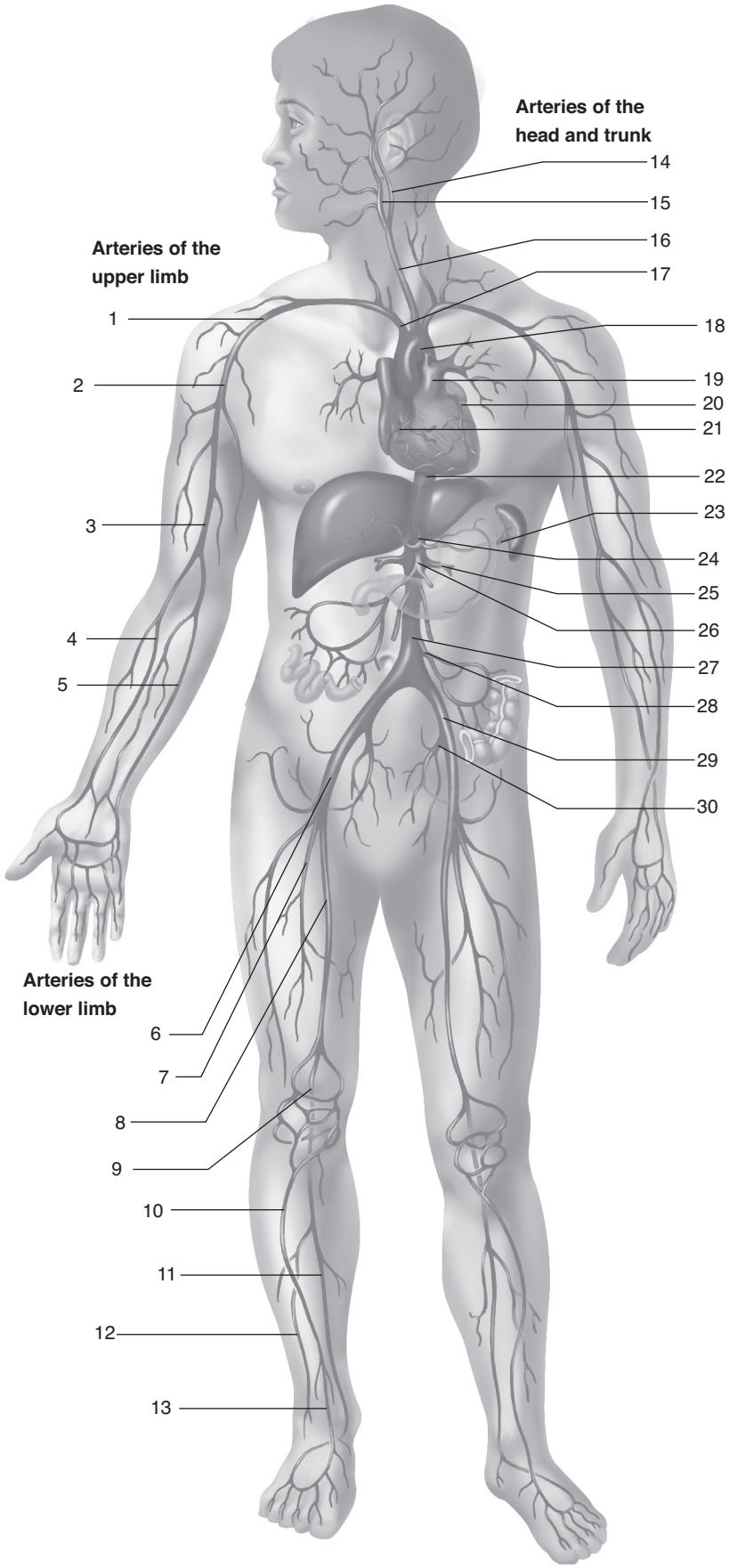
2) Small intestine.

Left ventricle → **Aorta a.** → **Superior mesenteric a.** → small intestine → **Superior mesenteric v.** → **Hepatic portal v.** → liver → **Hepatic v.** → **Inferior vena cava** → right atrium.

8. Systemic Arteries

Label the figure by writing the names of the numbered arteries in the spaces.

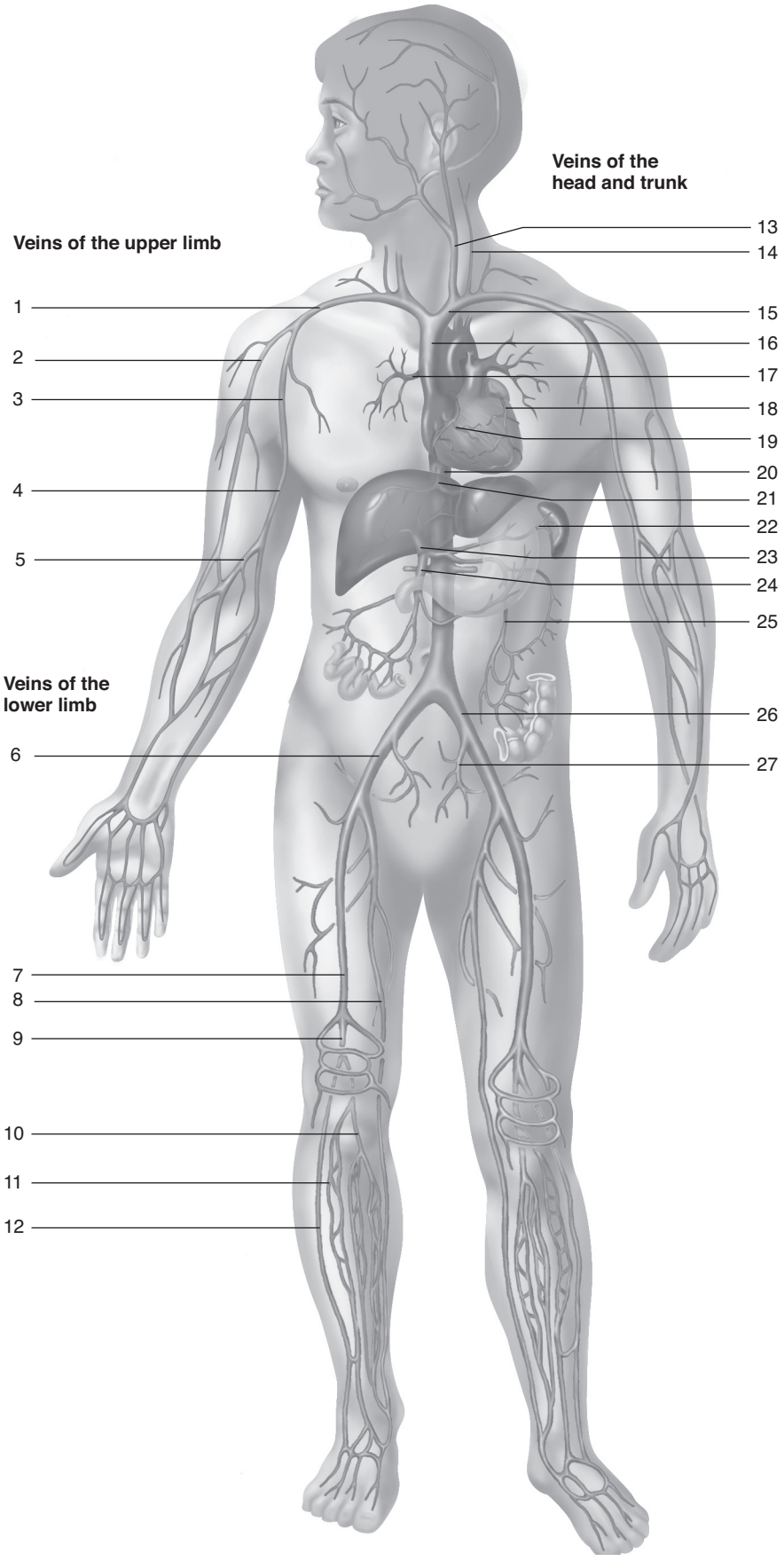
1) **Subclavian**
2) **Axillary**
3) **Brachial**
4) **Radial**
5) **Ulnar**
6) **External iliac**
7) **Deep femoral**
8) **Femoral**
9) **Popliteal**
10) **Anterior tibial**
11) **Posterior tibial**
12) **Fibular**
13) **Dorsal pedis**
14) **Internal carotid**
15) **External carotid**
16) **Left common carotid**
17) **Brachiocephalic**
18) **Aortic arch**
19) **Pulmonary trunk**
20) **Left coronary**
21) **Right coronary**
22) **Thoracic aorta**
23) **Splenic**
24) **Celiac trunk**
25) **Renal**
26) **Superior mesenteric**
27) **Abdominal aorta**
28) **Interior mesenteric**
29) **Common iliac**
30) **Internal iliac**



9. Systemic Veins

Label the figure by writing the names of the numbered veins in the spaces.

1) Subclavian
2) Cephalic
3) Axillary
4) Basilic
5) Median cubital
6) External iliac
7) Femoral
8) Great saphenous
9) Popliteal
10) Posterior tibial
11) Anterior tibial
12) Small saphenous
13) Internal jugular
14) External jugular
15) Left brachiocephalic
16) Superior vena cava
17) Right pulmonary
18) Grat cardiac
19) Small cardiac
20) Inferior vena cava
21) Hepatic
22) Splenic
23) Hepatic portal
24) Superior mesenteric
25) Inferior mesenteric
26) Left common iliac
27) Internal iliac



10. Disorders of the Heart and Blood Vessels

Write the disorders described by the statements in the spaces at the right.

1) Unusual heart sounds.	**Heart murmur**
2) Hardening of the arteries.	**Arteriosclerosis**
3) Death of a portion of the myocardium.	**Myocardial infarction**
4) Abnormal heart rhythm.	**Arrhythmia**
5) Inflammation of a vein.	**Phlebitis**
6) Chronic high blood pressure.	**Hypertension**
7) Swollen veins due to defective valves.	**Varicose veins**
8) Balloonlike enlargement of blood vessel.	**Aneurysm**
9) Fatty deposits in walls of arteries.	**Atherosclerosis**
10) Edema of lungs, viscera, legs, and feet.	**Congestive heart failure**

11. Clinical Applications 

a. A 60-year-old man complains of chest pain during moderate exercise. The pain goes away after he rests for a while. What is the likely cause of the pain? **A partially blocked coronary artery.**
Without treatment, what complications may arise? **He may have a heart attack.**

b. An accident victim has lost considerable blood. His blood pressure is only slightly below normal, and his pulse rate is elevated. How is the body compensating for the loss of blood? **The lost blood has been replaced by the reserve blood supply in the spleen.**

c. A patient has a blood clot in the right femoral vein. If a part of the clot should break loose, where is it likely to lodge? **In a pulmonary artery.**
Would this be a serious complication? **Yes** Explain.
If blood flow to the lungs is mostly blocked, oxygenation of blood is drastically reduced which may cause death.