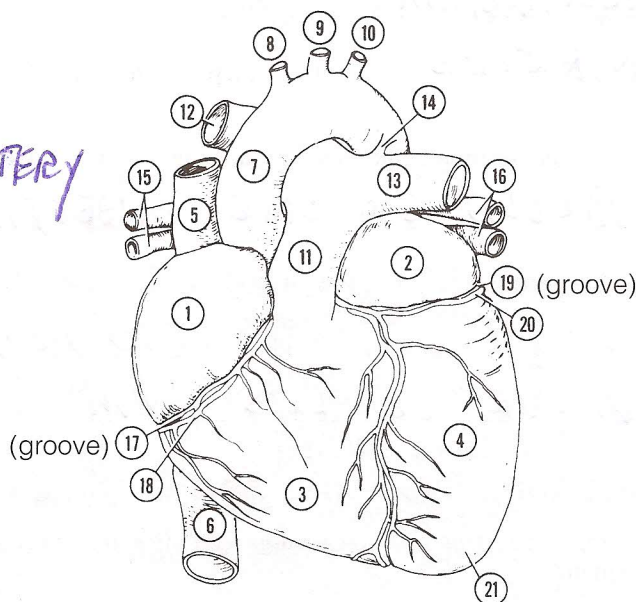


Anatomy of the Heart

Gross Anatomy of the Human Heart

1. An anterior view of the heart is shown here. Identify each numbered structure by writing its name on the correspondingly numbered line:

1. RIGHT ATRIUM
2. LEFT ATRIUM
3. RIGHT VENTRICLE
4. LEFT VENTRICLE
5. SUPERIOR VENA CAVA
6. INFERIOR VENA CAVA
7. AORTA
8. BRACHIOCEPHALIC TRUNK
9. LEFT COMMON CAROTID ARTERY
10. LEFT SUBCLAVIAN ARTERY
11. PULMONARY TRUNK
12. RIGHT PULMONARY ARTERY
13. LEFT PULMONARY ARTERY
14. LIGAMENTUM ARTERIOSUM
15. RIGHT PULMONARY VEINS
16. LEFT PULMONARY VEINS
17. CORONARY SULCUS
18. RIGHT CORONARY ARTERY
19. CORONARY SULCUS
20. CIRCUMFLEX ARTERY
21. APEX



2. What is the function of the fluid that fills the pericardial sac? LUBRICATION, FRICTION
REDUCTION
3. Match the terms in the key to the descriptions provided below. (Some terms may be used more than once.)

- CORONARY SINUS 1. drains blood into the right atrium
ATRIA 2. superior heart chambers
VENTRICLES 3. inferior heart chambers
EPICARDIUM 4. visceral pericardium
ATRIA 5. "anterooms" of the heart
MYOCARDIUM 6. equals cardiac muscle
CORONARY ARTERIES 7. provide nutrient blood to the heart muscle
ENDOCARDIUM 8. lining of the heart chambers
VENTRICLES 9. actual "pumps" of the heart

Key:

atria

coronary arteries

coronary sinus

endocardium

epicardium

myocardium

ventricles

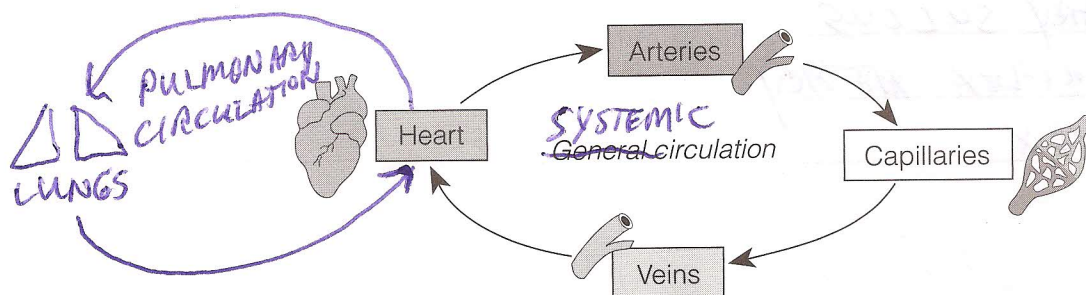
4. What is the function of the valves found in the heart? TO FORCE THE FLOW OF
BLOOD IN ONE DIRECTION THROUGH THE HEART
5. Can the heart function with leaky valves? (Consider this: can a water pump function with leaky valves?) YES
6. What is the role of the chordae tendineae? TO KEEP THE ATRIOVENTRICULAR
VALVE LEAFLETS FROM EVERTING INTO THE ATRIA

Pulmonary, Systemic, and Cardiac Circulations

7. A simple schematic of a so-called general circulation is shown below. What part of the circulation is missing from this diagram?

THE CIRCULATION TO THE LUNGS FROM THE RIGHT HEART

Add to the diagram as best you can to make it depict a complete systemic/pulmonary circulation, and re-identify "general circulation" as the correct subcirculation.



8. Differentiate clearly between the roles of the pulmonary and systemic circulations.

PULMONARY CIRCUIT
TAKES ALL INCOMING BLOOD FROM BODY & SENDS IT TO THE LUNGS;
BLOOD RETURNS TO LEFT HEART WHICH THEN SENDS IT TO THE SYSTEMIC
CIRCULATION

9. Complete the following scheme of circulation in the human body:

Right atrium through the tricuspid valve to the RIGHT VENTRICLE through the RIGHT SEMILUNAR
 _____ valve to the pulmonary trunk to the PULMONARY ARTERIES to the capillary
 beds of the lungs to the PULMONARY VEINS to the LEFT ATRIUM of the heart through the
MITRAL valve to the LEFT VENTRICLE through the LEFT SEMILUNAR
 valve to the AORTA to the systemic arteries to the CAPILLARIES of
 the SYSTEMIC tissues to the systemic veins to the SUPERIOR and
INFERIOR VENA CAVA entering the right atrium of the heart.

10. If the mitral valve does not close properly, which circulation is affected? SYSTEMIC

11. Why might a thrombus (blood clot) in the anterior descending branch of the left coronary artery cause sudden death?

BECAUSE O₂ DELIVERY WOULD BE SHUT OFF TO THE LEFT
VENTRICLE PREVENTING IT FROM FUNCTIONING & NO
BLOOD WOULD THUS BE PUMPED TO THE HEAD & BODY

Microscopic Anatomy of Cardiac Muscle

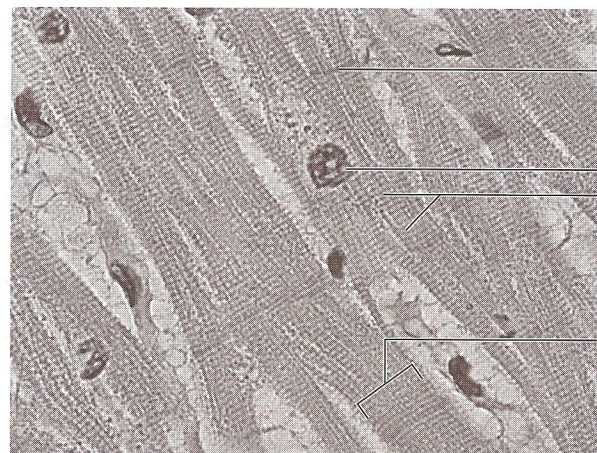
12. Add the following terms to the photo of cardiac muscle at the right:

intercalated discs

nucleus of cardiac muscle fiber

striations

cardiac muscle fiber



INTERCALATED
DISC

NUCLEUS
STRIATION

CARDIAC
MUSCLE
FIBER

13. What role does the unique structure of cardiac muscle play in its function? (Note: Before attempting a response, describe the unique anatomy.)

THE INTERCALATED DISCS SUPPLY STRENGTH TO
THE CELLULAR CONNECTIONS FOR LONG TERM USE; THE
SIDE BRANCHING ALLOWS FOR BETTER TWISTING
CONTRACTION & BETTER FORCE APPLIED TO THE BLOOD

Dissection of the Sheep Heart

14. During the sheep heart dissection, you were asked initially to identify the right and left ventricles without cutting into the heart. During this procedure, what differences did you observe between the two chambers?

LEFT HEART SEEMED BIGGER + THICKER THAN
RIGHT HEART

How would you say this structural difference reflects the relative functions of these two heart chambers?

RIGHT HEART ONLY HAS TO PUMP TO THE LUNGS
SO IT IS SMALLER; LEFT HEART PUMPS TO WHOLE
REST OF THE BODY SO MUST BE BIGGER

15. Semilunar valves prevent backflow into the VENTRICLES; AV valves prevent backflow into the

ATRIA.

Using your own observations, explain how the operation of the semilunar valves differs from that of the AV valves.

THE AV VALVES ARE INVOLVED DURING
FORCE GENERATION OF THE VENTRICLES; THE
SEMILUNAR VALVES ARE INVOLVED DURING CARDIAC
RELAXATION.

16. A remnant of the fetal structure is observable in the heart. What was it called in the fetal heart, where was it located, and what purpose did it serve as a functioning fetal structure?

DUCTUS ARTERIOSUS; BETWEEN PULMONARY TRUNK +
AORTA; ROLE IN FETAL LIFE IS TO SHUNT BLOOD
AWAY FROM THE LUNGS WHILE THE FETUS IS
STILL WITHIN THE WOMB.