



# The Heart

1. What is the function of the heart?

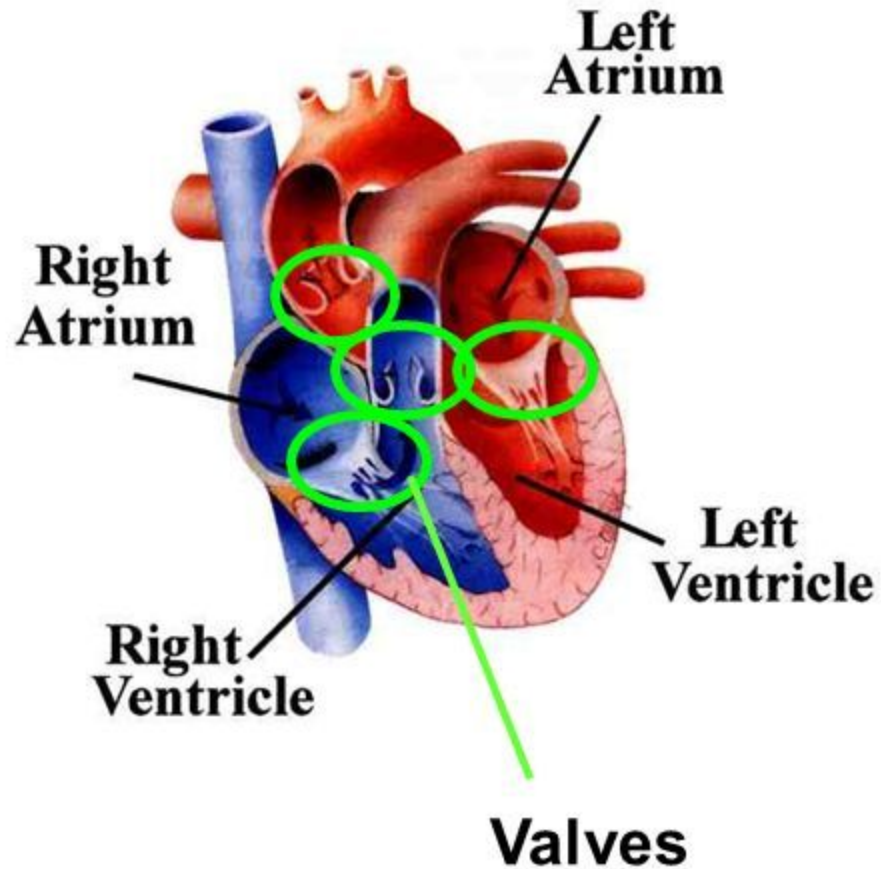
To pump blood around the body so the cells can receive oxygen and food and remove carbon dioxide.

2. Why does the heart have valves?

To help blood flow in one direction.

3. Symptoms of heart valve disease may include: breathlessness and tiredness. Why do these symptoms happen?

There is not enough oxygen and food being pumped to the cells in the body for respiration.



# Structure

Structure of the heart valves

Blood flow through the valves

The heart valves and the chambers are lined with endocardium.

Heart valves separate the atria from the ventricles, or the ventricles from a blood vessel. Heart valves are situated around the fibrous rings of the cardiac skeleton. The valves incorporate leaflets or **cusps**, which are pushed open to allow blood flow and which then close together to seal and prevent backflow. The mitral valve has two cusps, whereas the others have three. There are nodules at the tips of the cusps that make the seal tighter

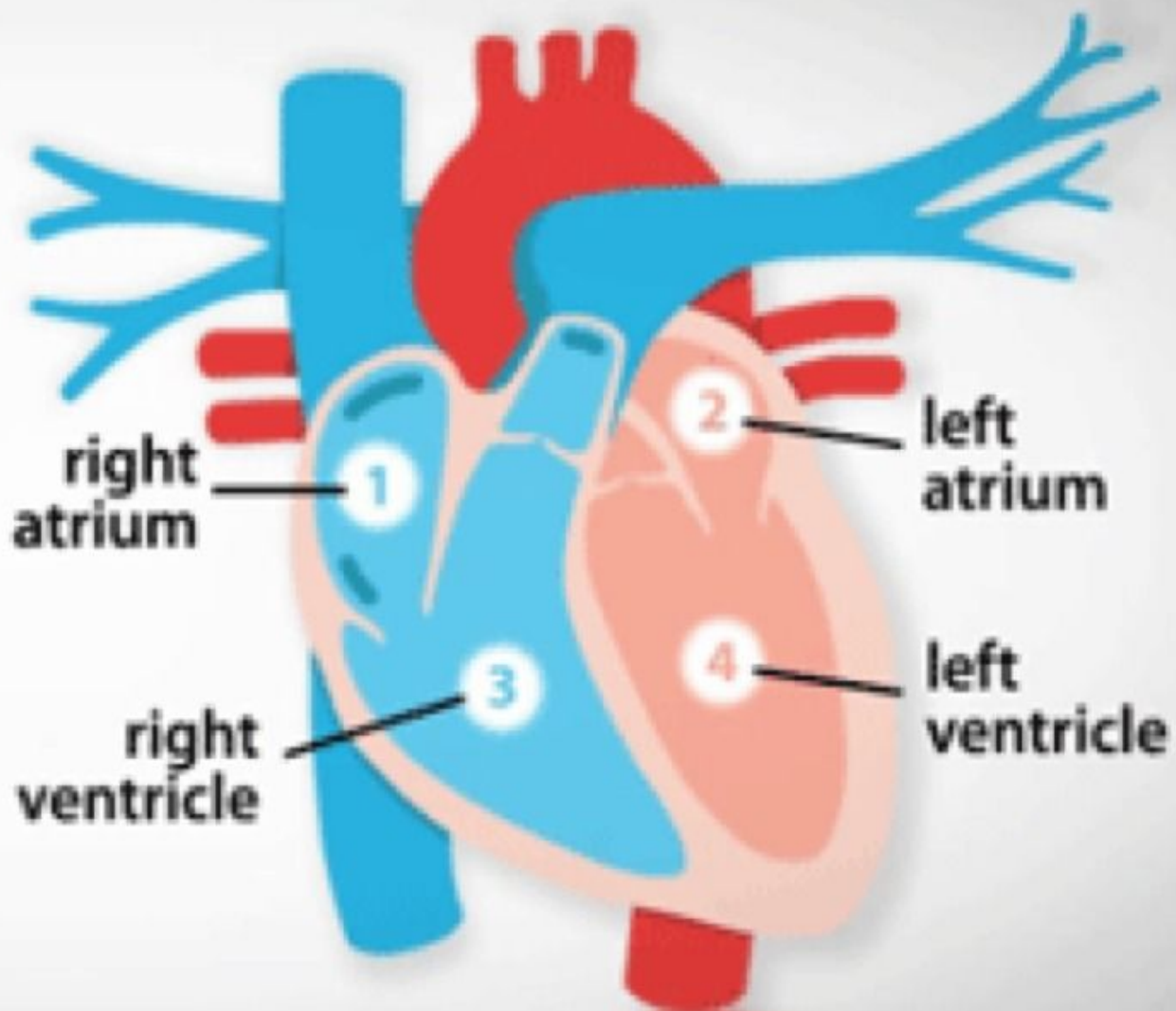
# Valves of the Heart

The schematic diagram below illustrates the four valves of the heart and how they are oriented within the heart. The heart valves in reality are not in this simplified orientation, but the diagram serves to show the valves and their relationship to each other.



жүрек клапандарын және палаталары эндокардом төселген отыр. Жүрек клапандары қарыншаның жылғы ATRIA бөліп, немесе қан кеме қарыншалар. Жүрек клапандар жүрек қаңқасының талшықты сақина айналасында орналасқан. клапандар қан айналымын мүмкіндік содан кейін пломба және жол бермеу үшін бірге жабу, ол үшін ашық итеріп жатыр парақшалар немесе Створок, қамтиды. басқалары үш бар, ал митральды, екі Створок бар. мөр тығыз жасауға өткір сөз туралы кеңестер узелки бар.





The four valves are known  
as:

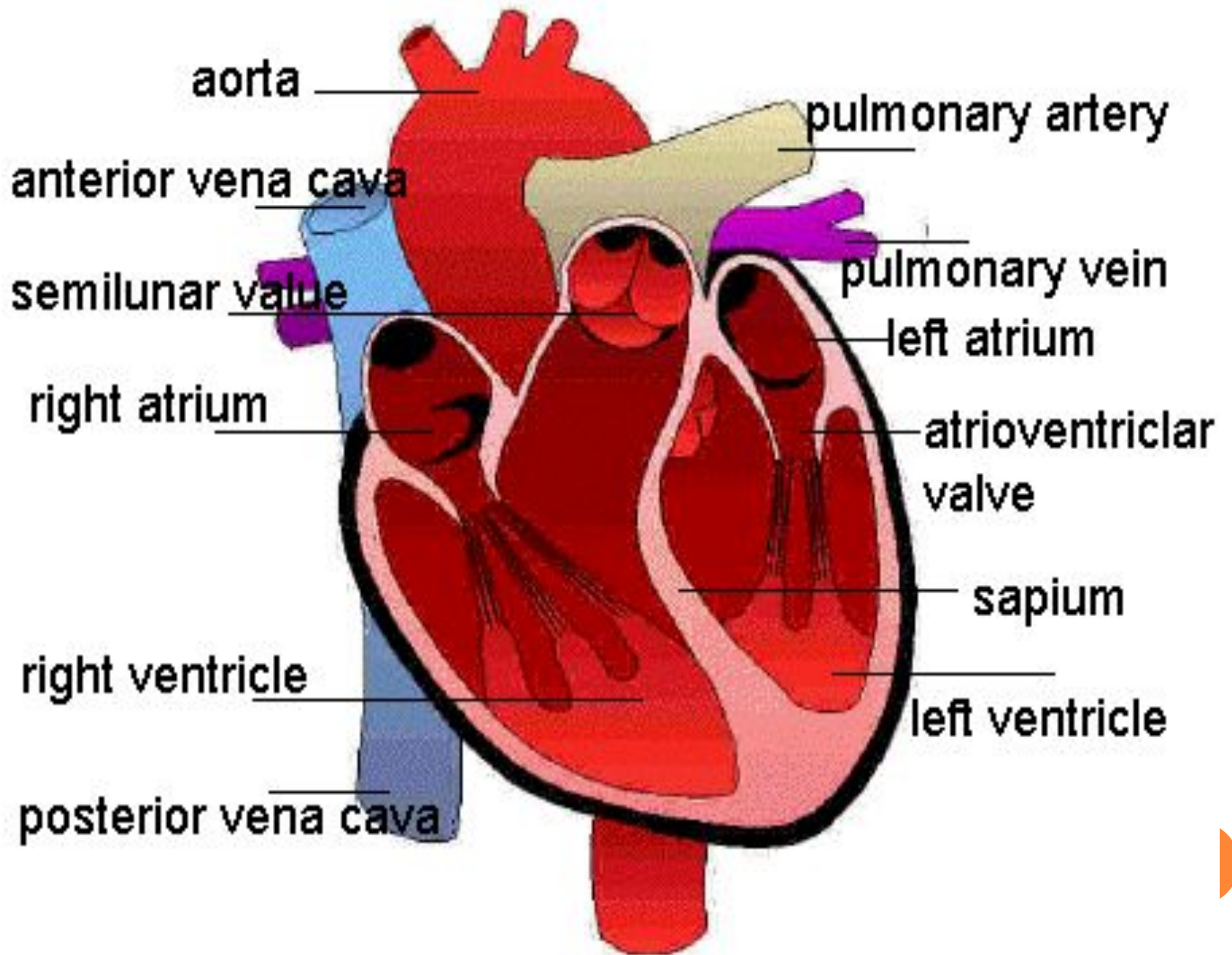
The tricuspid valve

The pulmonic or pulmonary valve

The mitral valve

The aortic valve

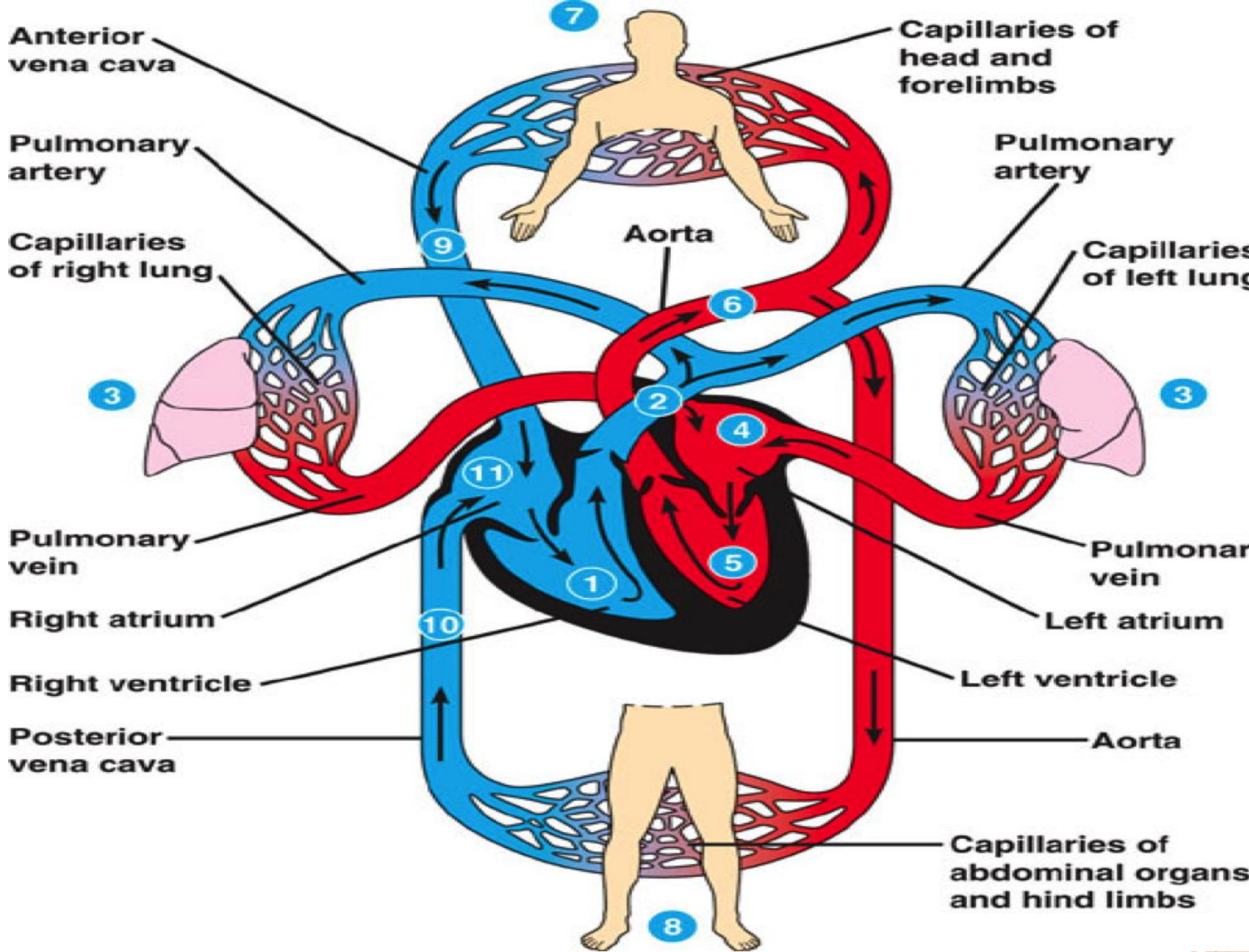






**Abstract**—Artificial Heart Valves and their functions, along with the types of patients that require them, will be addressed in this paper. The technology that is currently available as well as what is being developed will also be discussed.





Anterior vena cava

Pulmonary artery

Capillaries of right lung

Pulmonary vein

Right atrium

Right ventricle

Posterior vena cava

Capillaries of head and forelimbs

Pulmonary artery

Capillaries of left lung

Pulmonary vein

Left atrium

Left ventricle

Aorta

Capillaries of abdominal organs and hind limbs

Aorta

8

3

3

7

9

6

2

4

11

1

10

5

## **I. Introduction**

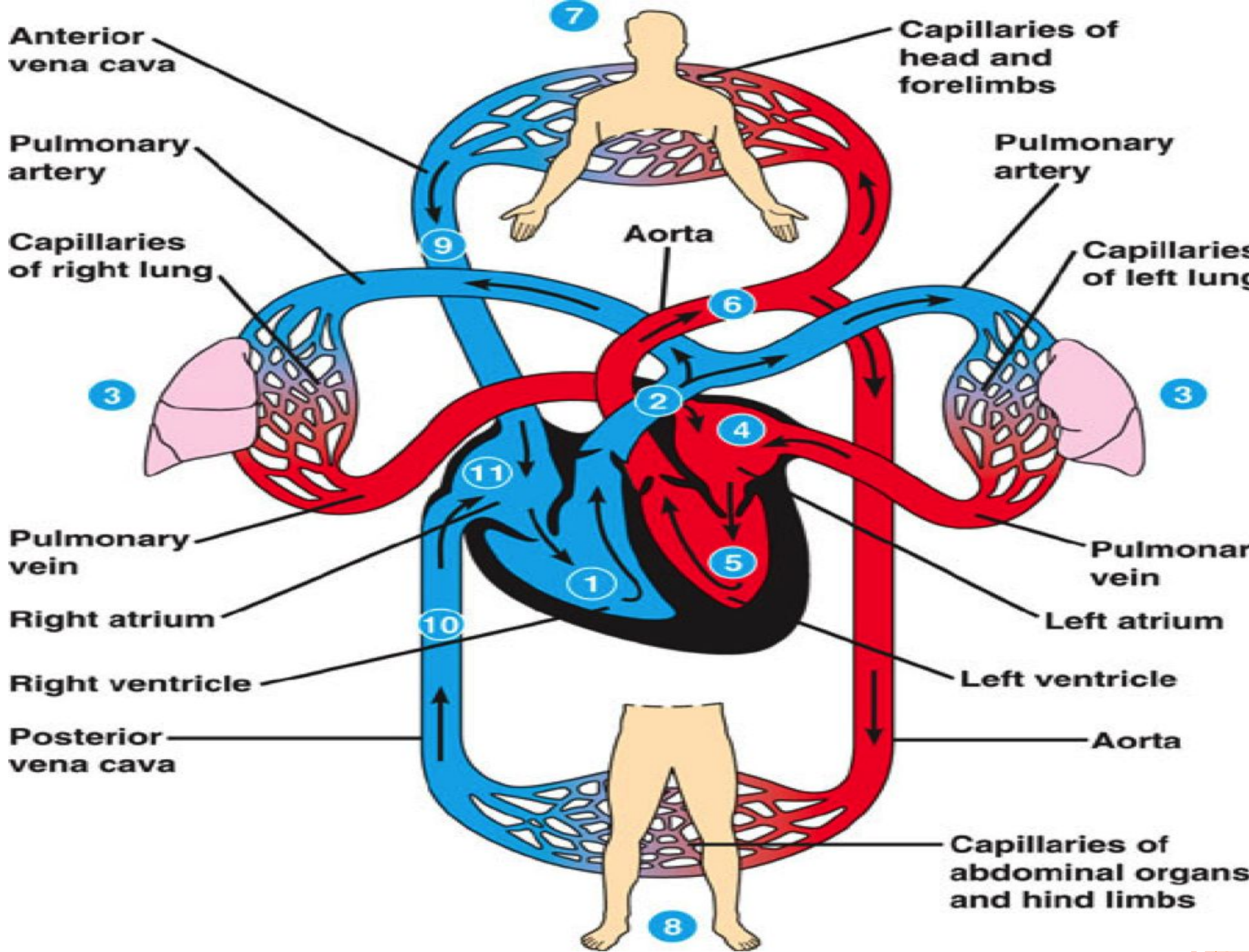
II. Artificial Heart Valves, just like natural heart valves, control the flow of blood from one chamber of the heart to the next. They are implanted on individuals who suffer from various valvular heart diseases. Depending on the actual disease of the patient, either a mechanical or a biological heart valve may be implanted through open-heart surgery.



## II. Methods

The first artificial heart valve was mechanical and it was invented by Dr. Charles Hufnagel in 1952. This ball valve was implanted in a thirty year old woman and, after the surgery, she was able to continue living as she had before. The only downside to this implantation was that it was not placed in the heart itself, but in the descending aorta, which did not fix the problem of the malfunctioning heart valve but instead, dealt with the symptoms





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Pulmonary vein

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### III. Results

The use of biological heart valves has been increasing more and more since they are less likely to cause problems in the long run.

Mechanical heart valves, being a machine, will tend to wear out and need replacement. Not only that, but the mechanical heart valves tend to also cause blood clots in some patients after they have been in use for several years. The biological heart valves, since they are in fact very similar to a human heart valve, act as a human's and, in turn, don't cause the problems that can be found in the mechanical ones

## IV. Discussion

The problems that are associated with both the mechanical and biological heart valves cause researchers to further develop newer models in order to deal with rejection in both types, and blood clots and blood infection in the mechanical heart valves. In the future, the blood valves will hopefully become durable enough to last a lifetime so that patients will not need open-heart surgery more than once. The biological heart valve rejection rate will hopefully also go down and allow more patients to be able to get them implanted.



# REFERENCES

1. "ARTIFICIAL HEART VALVE." WIKIPEDIA. N.P.. WEB. 14 OCT 2012. 2. "BIOLOGICAL HEART VALVES." CEDARS-SINAI. N.P., N.D. WEB. 14 OCT 2012.

2. "BIOLOGICAL HEART VALVES." CEDARS-SINAI. N.P., N.D. WEB. 14 OCT 2012. <HTTP

