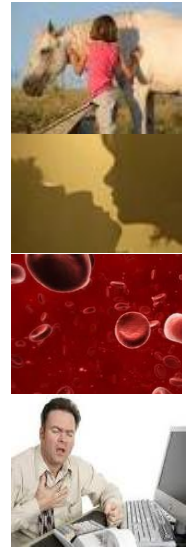


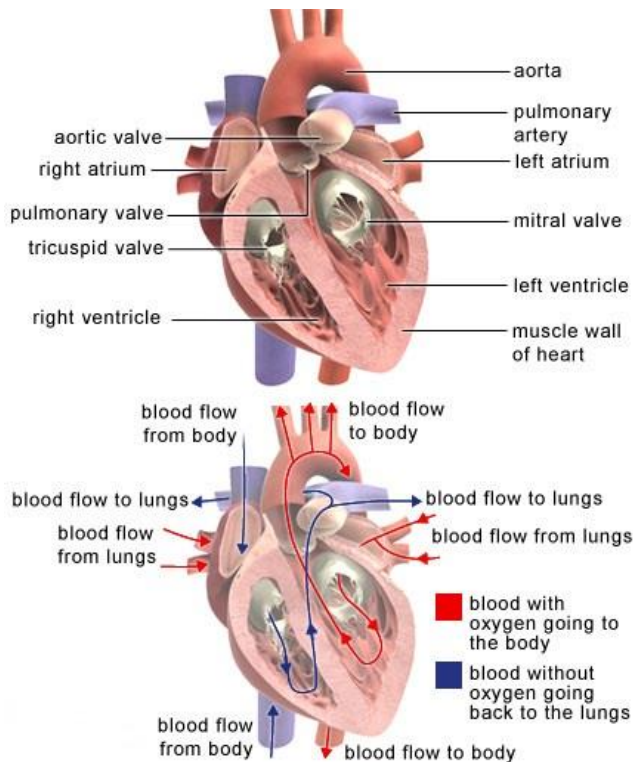
## The Heart

### Fascinating facts about the Heart

- A scientist found that horses' heart rates mirror those of human subjects touching them.
- A study of 2,500 men aged 49 to 54 found that having an orgasm at least three times a week cut in half the likelihood of death from coronary heart disease.
- Over the course of a day, about 100,000 heart beats shuttle 2,000 gallons of oxygen rich blood many times through about 60,000 miles of branching blood vessels that link together the cells of our organs and body parts.
- You're more likely to have a heart attack on Monday morning than at any other time of the week. Just another valid excuse to hate Mondays.



### Anatomy of the Heart



The heart is made up of four chambers, two atriums and two ventricles. There are also four main valves, the mitral valve, the tricuspid valve, and the aortic and pulmonary valves. See the diagram on the left showing a cross section of the heart. The atriums essentially act as chambers, whilst the ventricles act as pumps.

The diagram on the lower left shows the direction of blood flow through the heart. We will look at this methodically, explaining the function of each separate part.

### Physiology of the Heart

Blood flows from the body into the **right atrium** via the vena cava, and is de-oxygenated as it is returning from tissues around the body. The heart contracts and the blood flows into the **right ventricle**.

Once the ventricle is full, it contracts, **the tricuspid valve** closes and the pulmonary valve

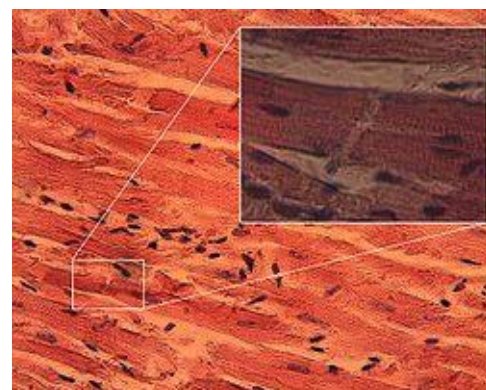
opens.

The closure of the tricuspid valve prevents blood from backing into the right atrium and the opening of **the pulmonary valve** allows the blood to flow into the pulmonary artery toward the lungs.

The blood flows round the lungs and becomes oxygenated, flowing back into the heart via the **pulmonary veins**. This is unusual as generally veins carry deoxygenated blood from the body back to the heart, whilst arteries carry the oxygenated blood away from the heart. In all instances, veins carry blood to the heart, while arteries carry blood away from the heart.

The blood reaches the **left atrium** which contracts, sending the blood into the **left ventricle** via the **mitral valve**. The **aortic valve** leading into the **aorta** is closed, allowing the ventricle to fill with blood. Once the ventricles are full, they contract. As the left ventricle contracts, the mitral valve closes and the aortic valve opens. The closure of the mitral valve prevents blood from backing into the left atrium and the opening of the aortic valve allows the blood to flow into the aorta and flow throughout the body.

The average adult heart beats 72 times a minute, 100,000 times a day, 3,600,000 times a year and 2.5 billion times during a lifetime, but does anyone ever wonder how it beats? It is controlled by the parasympathetic nervous system. The heart is made up of cardiac muscle, which is an involuntary (meaning you have no conscious control over it), striated muscle type found only in the heart. The cells making up the heart muscle are known as cardiac myocytes, and the contractions which cause a heart beat are known as myogenic contractions. They are initiated by the Sinoatrial Node, also known as the SA Node or sinus node.

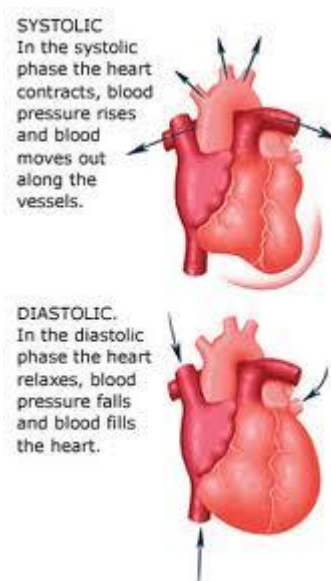


The Sinoatrial Node serves as the natural pacemaker for the heart. Nestled in the upper area of the right atrium, it sends the electrical impulse that triggers each heartbeat. The impulse spreads through the atria, prompting the cardiac muscle tissue to contract in a coordinated wave like manner.

The impulse that originates from the Sinoatrial node strikes the Atrioventricular node (or AV node) which is situated in the lower portion of the right atrium. The atrioventricular node in turn sends an impulse through the nerve network to the ventricles, initiating the same wave like contraction of the ventricles.

## Systole

The contraction of the cardiac muscle tissue in the ventricles is called systole. When the ventricles contract, they force the blood from their chambers into the arteries leaving the heart. The left ventricle empties into the aorta and the right ventricle into the pulmonary artery. The increased pressure due to the contraction of the ventricles is called systolic pressure. This pressure relates to the higher figure when you have your blood pressure taken e.g. **110/60**.



## Diastole

The relaxation of the cardiac muscle tissue in the ventricles is called diastole. When the ventricles relax, they make room to accept the blood from the atria. The decreased pressure due to the relaxation of the ventricles is called diastolic pressure. This relates to the lower figure when you have your blood pressure taken e.g. 110/**60**.

I hope you have enjoyed reading this article as much as I have enjoyed writing and researching it. Loving the heart.