

## Blood Flow

**Pulmonary circuit:** blood flows through the lungs for O<sub>2</sub>/CO<sub>2</sub> exchange

**Systemic circuit:** blood flows to the body

**Coronary circuit:** blood flow to tissues of the heart

Pulmonary vs systemic circulation

[http://www.wisc-online.com/objects/index\\_tj.asp?objID=AP12704](http://www.wisc-online.com/objects/index_tj.asp?objID=AP12704)



## Flow of Blood

1. The right side of the heart collects blood from the body (inferior vena cava) and the head (superior vena cava) in the right atrium

2. The right atrium pumps into the right ventricle and the right ventricle contracts and pumps blood to the lungs through the pulmonary artery

- Blood loses CO<sub>2</sub> and picks up O<sub>2</sub> in the lungs

3. Oxygenated blood from the lungs enters the left atrium

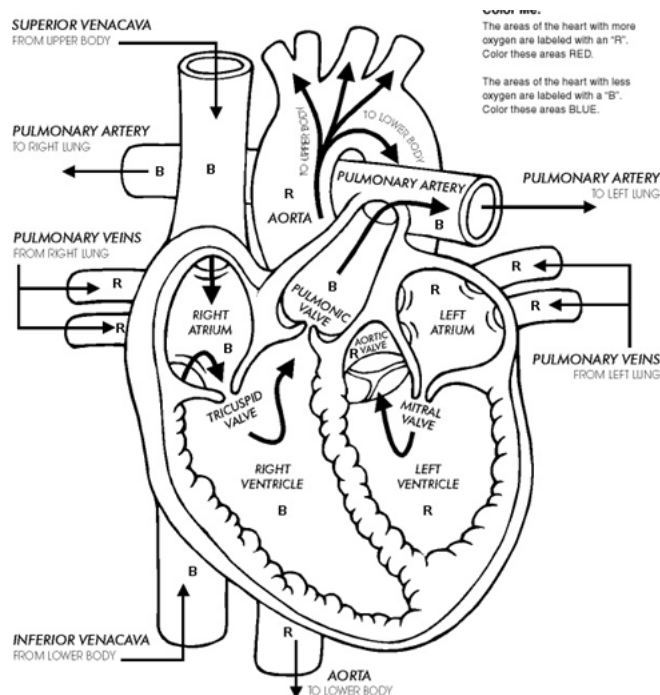
4. The left atrium pumps into the left ventricle and then the left ventricle pumps the blood out to the body through the aorta

5. The aorta also supplies the coronary arteries with blood

[http://www.nelson.com/ABbio20-30/teacher/protect/otr/Bio2030OTR/attachments/i\\_AnimationSimulation/anatomy\\_heart\\_v2.html](http://www.nelson.com/ABbio20-30/teacher/protect/otr/Bio2030OTR/attachments/i_AnimationSimulation/anatomy_heart_v2.html)



[http://www.nelson.com/ABbio20-30/teacher/protect/otr/Bio2030OTR/attachments/i\\_AnimationSimulation/blood\\_circulation.html](http://www.nelson.com/ABbio20-30/teacher/protect/otr/Bio2030OTR/attachments/i_AnimationSimulation/blood_circulation.html)



Blood flow through heart

<http://medmovie.com/mmdatabase/flash/0016a.swf>



## Control of the Heart

- receptors in the body monitor the concentration of chemicals in the blood and blood pressure:

- baroreceptors monitor pressure in the aorta and carotid artery
- chemoreceptors monitor amount of CO<sub>2</sub> in blood

- these receptors send signals to a specialized area in the brain called the medulla oblongata

- the medulla oblongata responds by stimulating one of two nerves:

- parasympathetic nerve tells heart to beat at a normal rate and arterioles to unconstrict
- sympathetic nerve tells heart to increase heart rate and arterioles to constrict

- These nerves control the heart by stimulating a specialized area in the right atrium called the sinoatrial node (SA node).

- the SA node is the pacemaker...it causes the heart to beat approximately 70 times per minute

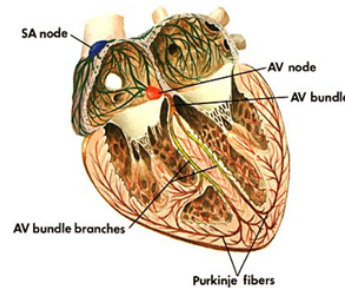
Sequence of events in a heart beat:

1. the beat (contraction) is generated in the SA node
2. electrical impulses pass on to both atria, causing them to simultaneously contract
3. the impulses then move on to a second node called the Atrioventricular node (AV node)
4. the message to contract is then relayed quickly down special nerves in the septum called the Bundle of His (AV bundle branches)
5. the message is sent into extensions of nerves in the ventricle walls called the Perkinje Fibers
6. both ventricles are now stimulated to contract at the same time

[http://www.nelson.com/ABbio20-30/teacher/protect/otr/Bio2030OTR/attachments/i\\_AnimationSimulation/cardiac\\_conduction.html](http://www.nelson.com/ABbio20-30/teacher/protect/otr/Bio2030OTR/attachments/i_AnimationSimulation/cardiac_conduction.html)



[http://www.nelson.com/ABbio20-30/teacher/protect/otr/Bio2030OTR/attachments/i\\_AnimationSimulation/ecg.html](http://www.nelson.com/ABbio20-30/teacher/protect/otr/Bio2030OTR/attachments/i_AnimationSimulation/ecg.html)



Read 'Diagnosing Heart Conditions on pg 324. Answer questions 1-4 on pg 324.

ECG of the heart

<http://medmovie.com/mmdatabase/flash/0007a.swf>



<http://medmovie.com/mmdatabase/flash/0038a.swf>



Arrhythmias

<http://medmovie.com/mmdatabase/flash/0078a.swf>



Read Heart Sounds on pg 325. Answer questions 7-9 on pg 325.

Heart Sounds Tutorial

<http://www.blaufuss.org/tutorial/index1.html>



Heart beat - EKG and Sounds

[http://library.med.utah.edu/kw/pharm/hyper\\_heart1.html](http://library.med.utah.edu/kw/pharm/hyper_heart1.html)

