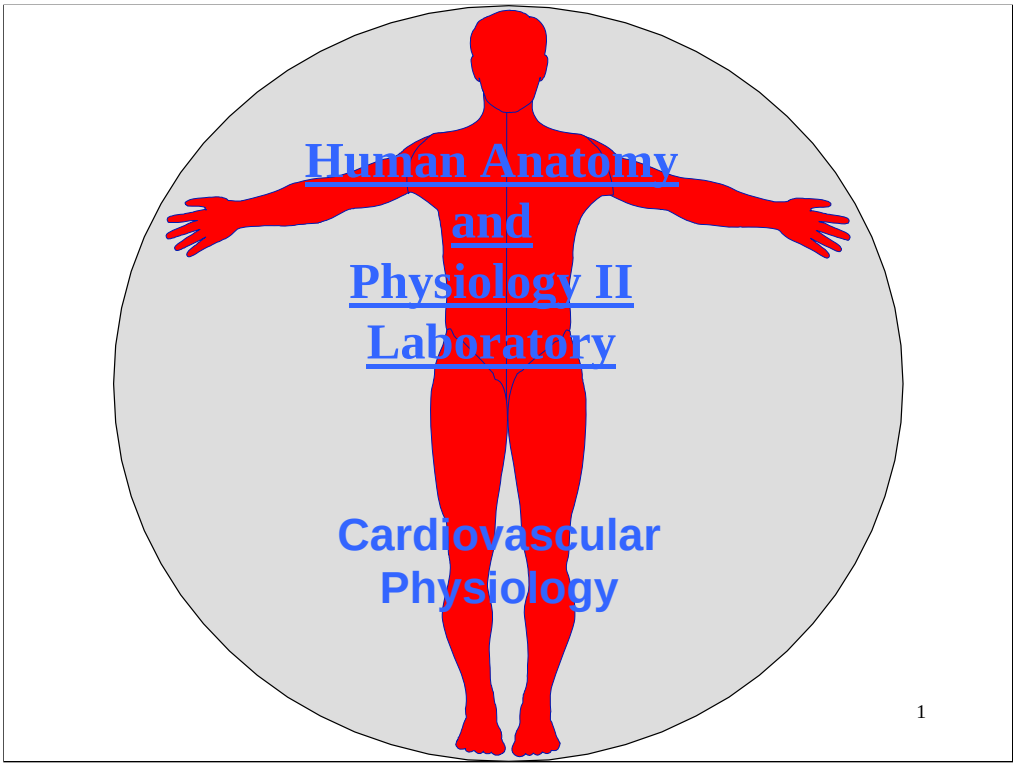
Mpeg 4 for iPod

mp3



This lab involves two exercises: 1) "*Conduction System of the Heart and Electrocardiography*" and 2) "*Human Cardiovascular Physiology: Blood Pressure and Pulse Determinations*".

Alternate Assignments: As per your intstructor's directions, either:

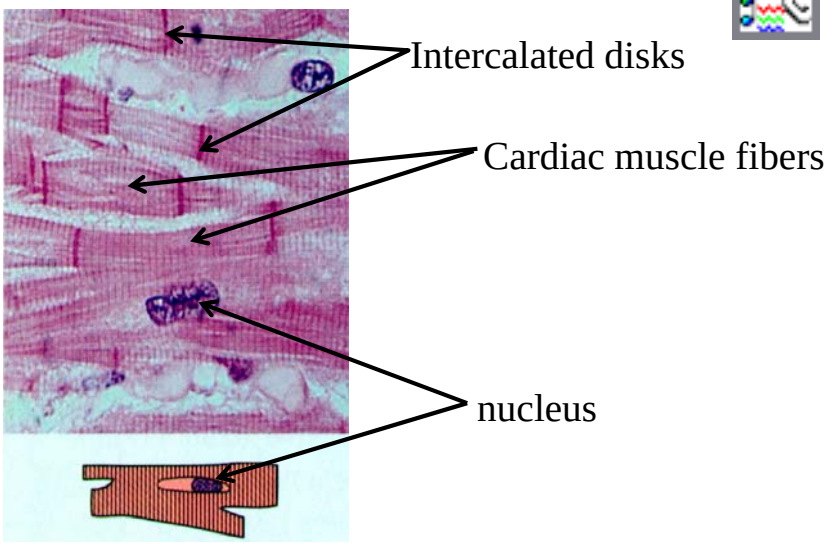
1) Complete the Review Sheets for the exercises , and/or

2) Use a bp cuff and a friend to collect data for pulse and bp. Analyze the data according to your instructor' directions.

Also take the related quiz on the cardiovascular physiology. Click on the sound icon for the audio file (mp3 format) for each slide.

There is also a link to a dowloadable mp4 video which can be played on an iPod.

Cardiac Muscle Structure



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Cardiac muscle cells are faintly striated, branching, mononucleated cells, which connect by means of intercalated disks to form a functional network. Intercalated disks are anchoring structures containing gap junctions which allow ions and electrical impulses to pass between cells. The action potential travels through all cells connected together forming a functional syncytium in which cells function as a unit.

Cardiac Muscle Characteristics

branched - connects to other cells through intercalated disks to form a network called a syncytium.

intercalated disks - gap junction intercellular connections which allow the impulse to pass to all cells connected to form the syncytium.

syncytium - a connected network of cells which function as a unit.

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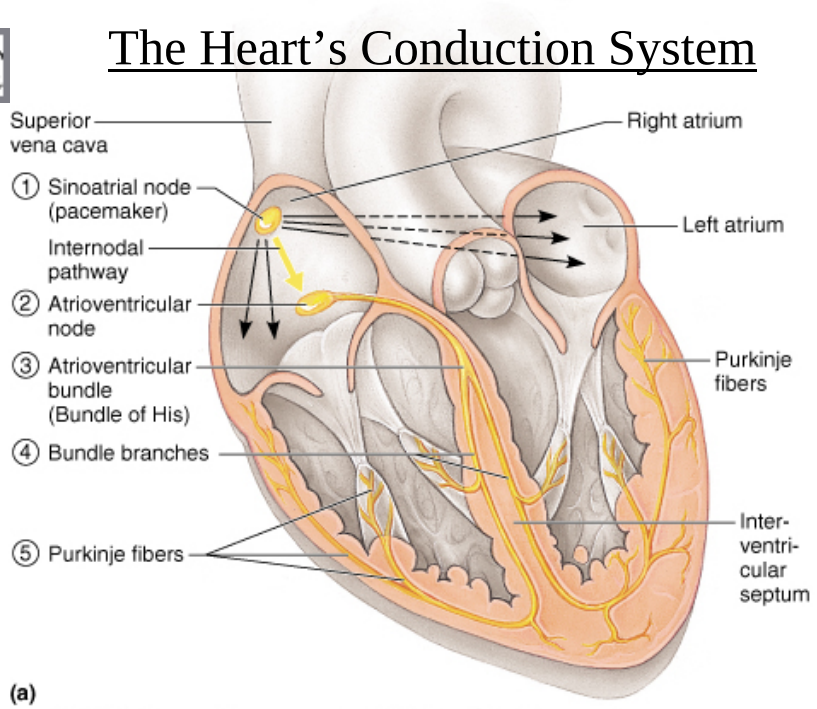
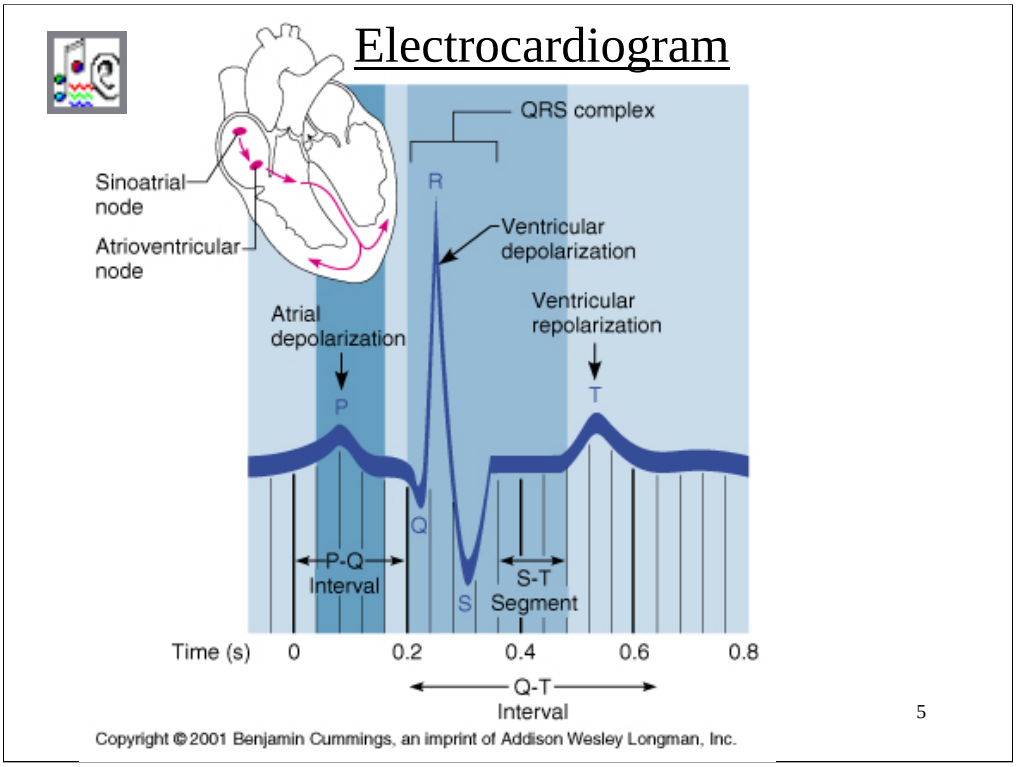
The Heart's Conduction System



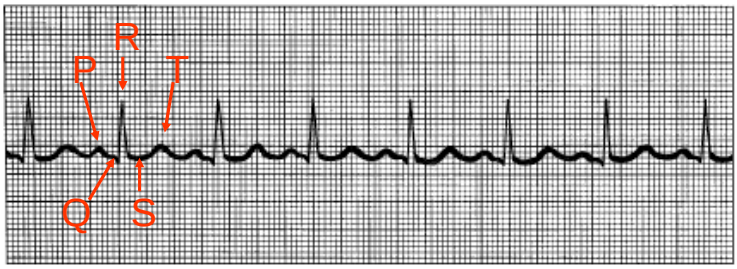
The SA node has the heart's fastest autorhythmicity and initiates the impulse. The impulse passes across the atrial myocardium and along the internodal pathways to the AV node. The AV node produces a delay of about .1 second and then passes the impulse to the Bundle of His. From there the impulse passes into the bundle branches and to the Purkinje fibers which distribute it to the ventricular myocardium.



The ECG is a recording of the heart's **electrical activity** as observed by the ECG electrodes. Varying leads produces varied appearance of the ECG, somewhat like looking at a mountain from different perspectives produces a different appearance. The mountain is the same but the appearance is different. The **physical activity** is presumed, but is **not shown** by the ECG.

There is no audio file for this slide.

Normal ECG



P wave – results from spread of atrial depolarization from SA to AV node.

QRS complex – depolarization from AV nodes into Purkinje fibers, plus atrial repolarization.

T wave – ventricular repolarization

6

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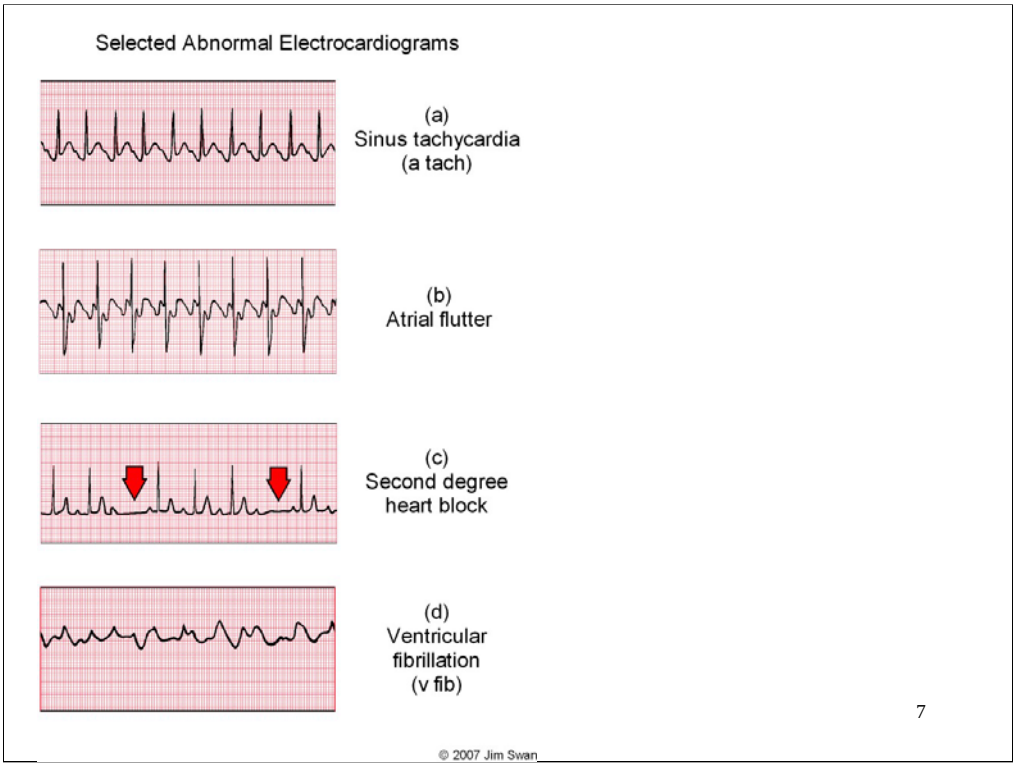
QRS complex – depolarization from AV nodes into Purkinje fibers, plus atrial repolarization.

T wave – ventricular repolarization

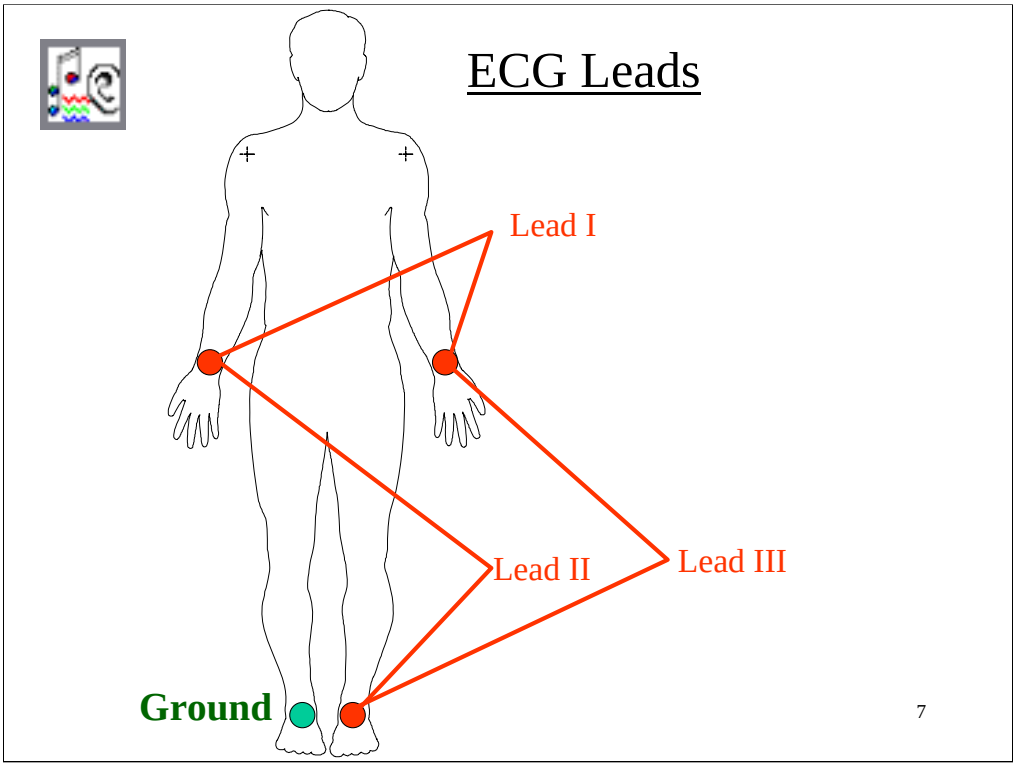


Sinus tachycardia, a.k.a. atrial tachycardia or a tach, is rapid heart rate produced by an abnormality in the SA node. It tends to occur more in young people, and usually disappears with age. Another form involves a short circuit around the AV node and results in an inverted P wave. Surgery is used to isolate and destroy the offending cells to restore normal rhythm.

Atrial flutter is seen most often in individuals with coronary artery disease or cardiomyopathy. It may precede atrial fibrillation, an electrical spasm in the atria. Since the atria do not pump blood, neither condition is life threatening, although they reduce the efficiency of the heart and may be very uncomfortable.

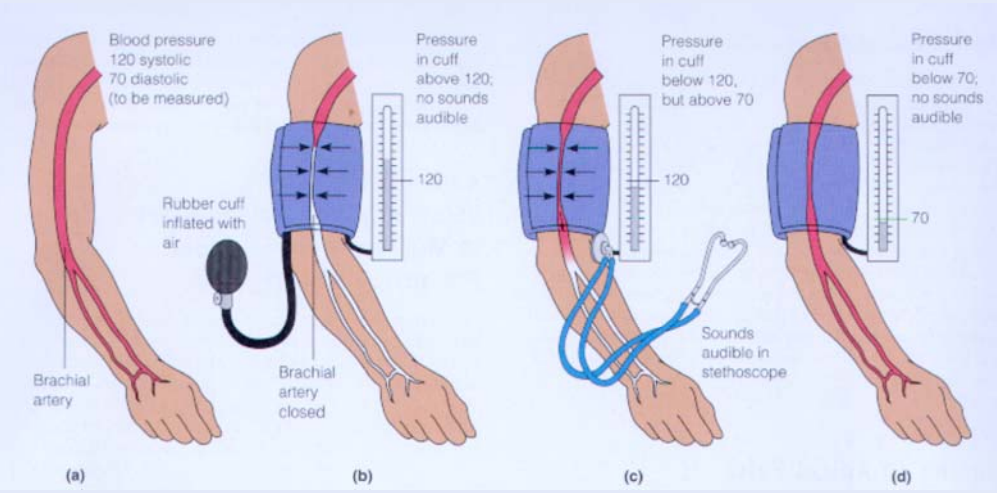
A **heart block** is a condition in which an impulse does not progress through the conduction system. A **second degree heart block** occurs in the AV node or further in the conduction system. Conduction is blocked and QRS waves are dropped, usually every other beat. This is usually treated with an implanted pacemaker.

Ventricular fibrillation is an electrical spasm in the ventricular muscle produced by scar tissue resulting from myocardial damage. It prevents the ventricles from beating normally and is life threatening. Defibrillators are used to repolarize the heart.



Leads are combination of two electrodes compared with the ground, always the right leg. Computers can produce a vector average of two electrodes and compare it to a second electrode, the ground being the reference point. Up to 12 leads are possible.

Blood Pressure Measurement



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The traditional way to measure blood pressure is with s sphygmomanometer or blood pressure cuff. When the cuff is inflated to a pressure greater than the subject's systolic pressure no blood flow sounds are heard. When the pressure is reduced to the subject's systolic pressure or less, sound is heard during systole. When the cuff pressure is less than the subject's diastolic pressure blood flow is continuous and no sound is heard. If you have access to a blood pressure cuff, take the blood pressure of a friend. Alternately, according to your instructor's directions, use the **PhysioEx CD** to collect data to analyze.

Data Collection: Posture

Data Table

Posture

	Trial 1		Trial 2	
	BP	Pulse	BP	Pulse
Sitting quietly				
Reclining (after 2 to 3 min)				
Immediately on standing from the reclining position ("at attention" stance)				
After standing for 3 min				

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This assignment is to be done according to your instructor's directions. You will either collect data on your own with a friend, using a blood pressure cuff and manually recording the pulse, or you will use the PhysioEX CD to collect the data, or you may be given sample data. Analyze the data according to your instructor's directions, drawing conclusions as to the effect of posture on pulse rate and blood pressure, and the mechanisms involved in producing these effects.

Data Collection: Exercise

Data Table Page 343

Exercise

Harvard step test for 5 min at 30/min	Baseline		Interval Following Test: Immediately		1 min		2 min		3 min	
	BP	P	BP	P	BP	P	BP	P	BP	P
Well-conditioned individual	___	___	___	___	___	___	___	___	___	___
Poorly conditioned individual	___	___	___	___	___	___	___	___	___	___

10

This assignment is to be done according to your instructor's directions. You will either collect data on your own with a friend, using a blood pressure cuff and manually recording the pulse, or you will use the PhysioEX CD to collect the data, or you may be given sample data. Analyze the data according to your instructor's directions, drawing conclusions as to the effect of exercise on pulse rate and blood pressure, and the mechanisms involved in producing these effects.

Lab Protocol for Cardiovascular Physiology

1) Complete the Review Sheets for the two exercises, or collect data as per your instructor's directions.

2) Take the related quiz on Cardiovascular Physiology.

There is no audio file for this slide.

Lab Prococol

1) Complete the Review Sheets for the exercises.

2) Use a bp cuff on a friend to collect data for pulse and b.p.

Analyze the data according ot instructor's directions.

3) Take the cardiovascular quiz.