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To go to any of these pages, you can click on their title or page number on this Table of Contents. Each page has a link that will bring you back to this page if you wish to use this for navigation. You can also click on the Red Arrows to go to the next or previous page. Finally, you can click on the Navigation Panel toolbar, located to the right of the Printer Icon at the top of the screen. Then, look for the *Bookmark* tab, instead of the *Thumbnails*. These bookmarks serve as links to guide you throughout the document.



## Using this CD-ROM

### Technical Stuff

#### Navigating through Acrobat Reader:



Each page has navigation links sending you on, or taking you back to the Table of Contents. On the Table of Contents page, you can click on the words of any of those pages, and it will take you there. You can also click on the BOOKMARK tabs (pictured and located in the upper left of your screen (Version 5.0) and you will see a series of navigation links. The red arrows take you to the previous and next pages.

#### Playing Movies:

The movies are connected to the Acrobat Reader File and are located in the Movies Folder on your CD. By clicking on the places indicated on the page, Acrobat Reader automatically starts the QuickTime program to play the movie. If you have not installed QuickTime, see the *ReadMeFirst* file on the CD for links of where you can download this free software.

Some movies are formatted to play within the visible window, and not as a pop-up window. These movies are activated simply by clicking on the picture, can be stopped by clicking on another part of the page. You can also adjust the viewing size by utilizing the controls on the Menu bar to magnify the page. Change the magnification and use the scrollbars until the movie fits within the screen and plays at a scale that your computer can play fluidly. (This method is the only current way that is compatible for Mac OS X users.)



Once you start playing a movie, you can use the control bar at the bottom of the movie's window to move forward or backward in the movie, or to pause it. **To exit a movie before it is finished, press ESC located in the upper left part of your keyboard.**

### Troubleshooting

*When I click on the movies, they won't work?*

*Mac OS X Users:* At time of production, Acrobat Reader is not fully functional and will not play movies in pop-up windows. (2x and Max.) Use the QuickTime option.

*For other users:* There are two possible problems and solutions. First, check to make sure that you have QuickTime 4 or better installed on your computer. See the *ReadMeFirst* file for information on how to do this. Second, make sure that you have Acrobat Reader 4 or higher installed. Acrobat Reader 3 will allow you to read this file, but will not play the movies correctly. The *ReadMeFirst* file has info on how to upgrade your version of Acrobat Reader.

*When I play the movies in the small mode, it is fine; but in large modes, the movies are choppy and hard to read. Any possibilities?*

The computer processor is not fast enough or your CD drive doesn't deliver the information fast enough. Either try the CD on a faster computer, or play the smaller versions of the movies.

*The movies are too light or too dark.*

Unfortunately, the settings of Mac and PC monitors are different. Movies play lighter on Macs and darker on PCs. You can adjust your own monitor if necessary from your control panel, but the movies were produced to try to be a compromise and work on both.

*The **Max** mode is no different than **2x**.*

This means your monitor is set to a resolution of 800 x 600. In order to take advantage of playing full screen, go to your control panels and set your resolution to 1024 x 768 or greater.



Hit **ESC** to exit movie windows.

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## Educational Purpose

This project was produced with many different possibilities for use. What is suggested here is to use this as a tool to help further the development of technical interpreting skills in a typical college setting.

This lecture focuses on the Cardiovascular System. Each text is presented twice, once in a technical format (*Actual times: ASL--14:12; English--15:39*) and once in a warm-up format (*Actual times: ASL--6:08; English--6:18*). You may choose to start with the warm-up text to familiarize yourself with the idiosyncrasies of the presenters and begin basic analysis of the concepts presented before attempting the technical text. The transcripts of the English texts are provided. The notes from the Deaf presenter are provided as a guide to the ASL text. You will also find a handout "Specialized Vocabulary/Diagrams" referred to in the presentations. It is recommended that you utilize these resources in developing a plan for the interpretation of each text.

Depending on the level of skill and your imagination, this text may be used as a tool for:

- 👋 Message Analysis
- 👋 Discourse Analysis
- 👋 Visualization Practice
- 👋 Analysis for Message Equivalence
- 👋 Vocabulary Building
- 👋 Language Models
- 👋 Interpreting Model
- 👋 Expressive Interpretation or Transliteration
- 👋 Receptive Interpretation
- 👋 Fingerspelling Recognition
- 👋 And the list goes on...

It is important to note that the participants involved in this project were not allowed to endlessly rehearse their presentation. It was a goal of this project to provide stimulus materials that reflect as closely as possible actual live situations. The interpreting models provided are used only as one of many possibilities. The interpreter was allowed to view both the English text and the ASL text once before attempting the piece. This is not to imply it is the only model or the only choices that could or should be made.



Hit **ESC** to exit movie windows.

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# Meet the Instructors & Interpreter

The movies on this page give some background about the instructors, Paul Buttenhoff and Kendall Kail, and the interpreter, Patty McCutcheon. They allow an opportunity to familiarize yourself with their signing/speaking styles before starting with the actual cardiovascular lectures. So, be sure to "meet your instructors and your interpreter" before moving on.

Click on picture to play the movie with - in the window.

Click on 2x to to play it in larger scale.

Click on Max to play it full screen.

Click QT to open in QuickTime program.

See Using this CD-ROM for details.

**Intro to Paul Buttenhoff**

**Intro to Kendall Kail**

**Intro to Patty McCutcheon**

**2x**

**Max**

**2x**

**Max**

**2x**

**Max**

**QT**

**QT**

**QT**

This length of this intro is 1:16.

This length of this intro is 1:16.

This length of this intro is 2:32.

[Click here to see written transcripts of introductions for Paul, Kendall and Patty.](#)



Hit **ESC** to exit movie windows.

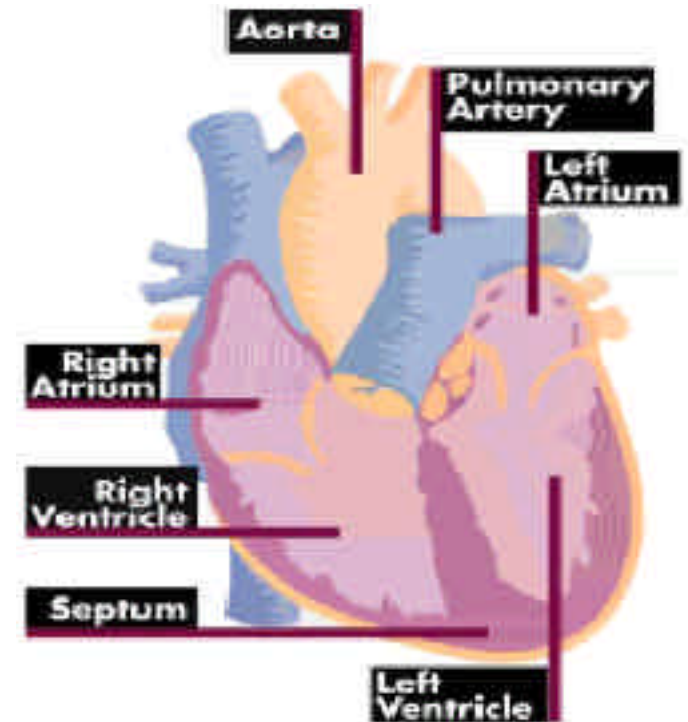
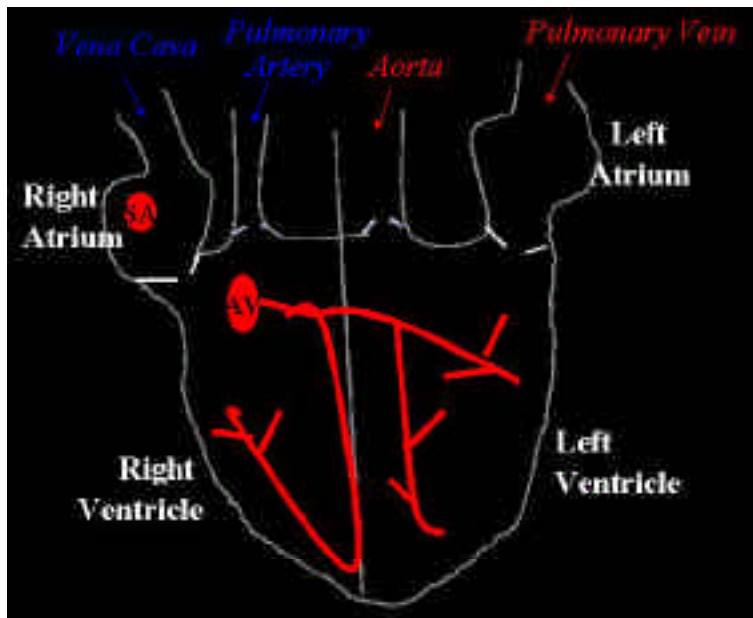
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## Specialized Vocabulary & Diagrams

These terms are present in the English and ASL lectures about the Cardiovascular System. In order to prepare for the lectures, you may wish to use the diagrams and other materials to familiarize yourself with the material.

- |                    |                     |                             |
|--------------------|---------------------|-----------------------------|
| 1. Right Atrium    | 10. Arteries        | 19. Atrioventricular Node   |
| 2. Right Ventricle | 11. Veins           | 20. Atrioventricular Bundle |
| 3. Pulmonary Trunk | 12. Capillaries     | 21. Purkinje Fibers         |
| 4. Pulmonary Veins | 13. Autorythmic     | 22. Arterioles              |
| 5. Left Atrium     | 14. Pulmonary Loop  | 23. Venules                 |
| 6. Left Ventricle  | 15. Systemic Loop   | 24. Diffusion               |
| 7. Aorta           | 16. Bicuspid Valve  |                             |
| 8. Cardiovascular  | 17. Mitral Valve    |                             |
| 9. Glucose         | 18. Sinoatrial Node |                             |



Hit **ESC** to exit movie windows.

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# Cardiovascular System--Warm-Up Lecture

In approaching the instructor and asking what today's class will focus on, you receive this response:  
"Today we'll be discussing the Cardiovascular System, one of the primary systems for transportation in your body. We'll talk first about some tissues that we find then a little more specifically about the heart and lastly we'll talk about function."

Paul in English

Kendall in ASL

**2x**      **Max**  
**QT**

This length of this lesson is 6:18.

[See written transcript of Paul's Warm-up Lecture](#)

**2x**      **Max**  
**QT**

This length of this lesson is 6:08.

[s Outline for ASL Lecture](#)

Click on picture to play the movie with - in the win - dow.

Click on 2x to to play it in larger scale.

Click on Max to play it full screen.

Click QT to open in QuickTime program.

See Using this CD-ROM for details.



Hit **ESC** to exit movie windows.

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# Cardiovascular System--Technical Lecture

In approaching the instructor and asking what today's class will focus on, you receive this response:  
"Today we'll be discussing the Cardiovascular System, one of the primary systems for transportation in your body. We'll talk first about some tissues that we find then a little more specifically about the heart and lastly we'll talk about function."

Click on picture to play the movie with in the window.

Click on 2x to play it in larger scale.

Click on Max to play it full screen.

Click QT to open in QuickTime program.

See Using this CD-ROM for details.

**Paul in English**

**Kendall in ASL**

**2x Max**  
**QT**

This length of this lesson is 15:39.

[See written transcript of Paul's Technical Lecture](#)

**2x Max**  
**QT**

This length of this lesson is 14:12.

[See Outline for Kendall's ASL Lecture](#)



Hit **ESC** to exit movie windows.

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# Cardiovascular System--Technical Lecture

*Model Interpretations by Patty McCutcheon*

Click on picture to play the movie with - in the window.

Click on 2x to play it in larger scale.

Click on Max to play it full screen.

Click QT to open in QuickTime program.

See Using this CD-ROM for details.

English to ASL

ASL to English

**2x**      **Max**  
**QT**

This length of this lesson is 15:40.

**2x**      **Max**  
**QT**

This length of this lesson is 14:12.



Hit **ESC** to exit movie windows.

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# Transcripts of Introductions

*If you wish to view the movie while reading the transcript, you can also click on the picture to the right, and it will play in that location allowing you to see both the movie and the transcript.*

## **Paul Buttenhoff Biography:**

Hello, my name is Paul Buttenhoff. I'm an assistant faculty member here at the College of St. Catherine in Minneapolis. I teach in the Liberal Arts and Sciences program and my specialty is Anatomy and Physiology. I teach several courses throughout the year at different levels. My educational background, I have a Bachelor's degree from Wyoming in Zoology and I have a Master's degree in Physiology from Auburn University in Alabama.

## **Kendall Kail Biography:**

Hello my name is Kendall Kail. I grew up in Iowa as a Deaf member of a hearing family. I graduated from a mainstream educational system and after awhile I moved to Minnesota. I've been in the Twin Cities for seven years. I'm currently a student at the University of Minnesota majoring in Kinesiology.

## **Patty McCutcheon Biography:**

Hi, my name is Patty McCutcheon. I'm originally from Wisconsin. I graduated from North Central Technical Institutes Educational Interpreter Training Program in 1980. Immediately after graduating I was certified by RID. I currently hold CSC. I am currently the coordinator of services for Deaf and Hard of Hearing students at Winona State University in Winona, Minnesota, as well as doing freelance in the Twin Cities area.



Hit **ESC** to exit movie windows.

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## Transcription of Warm-up Lecture

*with Paul Buttenhoff*

**T**oday I'd like to talk to you a little bit about the cardiovascular system, one of several systems in your body that function in transportation. However, the cardiovascular system is the most important system in terms of carrying things around in your body. We have to talk just a little bit about the components of the cardiovascular system before we can see how it works as a unit.

To strip things down, your cardiovascular system contains two primary regions. The first region will be your heart, which is an organ about the size of a softball, more or less; it is located in the upper portion of your body called your thoracic cavity. We also, from the heart and to the heart have a series, miles and miles actually, of tubes that carry blood both away from the heart and eventually back towards the heart.

Your heart has several special properties. First of all think of its job. It never gets a break, never gets a fifteen-minute time out, it beats from development embryologically until death. The heart is the only location in the body where we find cardiac muscle cells. These cells are extremely durable. These cells have incredible endurance and these cells also have a few other special properties. The cells in your heart can act all by themselves. If you leave your heart alone it will beat, on average, about 100 times per minute. It can work without any intervention from your brain or spinal cord. However we usually try to control it a little more readily because sometimes we sleep and we shut, or slow our heart down a little bit. Or, sometimes we're in a nasty traffic situation and blood pressure goes up a little bit and things start working a little more rapidly.

A heart is going to have several primary functions, using this striated or stripped arranged in a very specific fashion, cardiac muscle, your heart will receive blood from body tissues. Your heart will then send blood up to your lungs where it can fill with the very important molecule called oxygen. Blood will return to the heart, now containing oxygen, and last but not least, your heart has the responsibility of sending this blood, that now contains oxygen the stuff that life is made of for us out to every single tissue in the body.

If you were to look inside the heart you would see four small hollow spaces. These hollow spaces are called chambers and they have several different functions. On the right side of the heart there are two chambers, a top and a bottom chamber as there are on the left side of the heart. The right side of the heart specializes in dealing with blood that does not contain oxygen. The left side of the heart specializes in receiving and pumping to the rest of the body good, oxygenated, red, perfect, beautiful blood. In order to operate effectively, we've got to control these chambers. These four separate spaces controlled and surrounded by cardiac muscle have to be coordinated. If they did their own thing, we wouldn't be around very long to worry about them.

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## Transcription of Warm-up Lecture (cont.)

There's a small region called a pacemaker located on the right side of your heart. Your pacemaker is going to be important because, although the heart can operate by itself, it's truly the pacemaker, as the name implies that sets the pace and causes each contraction. Under resting conditions an average heartbeat might beat 80 times per minute, although it can go up to as many as 200 per minute during heavy activity or stress and it can also drop significantly lower. The pacemaker is a special group of cells that generates a tiny little electrical impulse, every so often. We'll say 100 times per minute. After that impulse is generated, your heart becomes excited. First of all, the top half of the heart becomes excited and then a split second later the bottom half of the heart becomes excited. By having these hollow chambers that can receive and squeeze blood in different directions and by regulating them in a specific fashion, we can very effectively take blood into our heart, send it up to our lungs, return oxygenated blood to the heart and last but not least send that good oxygenated blood out to the body.

In order to carry oxygen to tissues, maybe your big toe, maybe your eyeball or your pancreas, we are going to use hollow tubes that are surrounded by muscle that we collectively refer to as blood vessels. Now blood vessels come in a bunch of different varieties perhaps you've heard the term arteries or arterioles or capillaries or perhaps venules or veins. There are going to be several different types of hollow tubes that carry blood away from your heart, down to some region in your body and there will be several types tubes that carry blood from that region in your body back to your heart. It's really an incredible loop. Every day your cardiovascular system, your heart and your blood vessels function by moving about 2000 gallons of blood. Now you don't have 2000 gallons of blood in you, what that 2000 represents is your internal blood volume recycled many times. It's a wonderful recycling system in our body.

Blood flows away from the heart in structures... excuse me, in structures called arteries. Once blood gets to your big toe or your pancreas, oxygen and glucose and sugar and all the nutrients that your big toe needs to survive, on a minute to minute basis, are delivered from arteries. Your big toe, as a result of being alive, produces waste materials that must be removed, less they cause harm. Materials such as carbon dioxide, a waste product, and some other acids that can cause harm are carried from your big toe, for example, back up to the heart through structures known as venules or veins. So, we really have two systems; we have an away system from the heart and we have a towards system from the heart. Using both of these loops and a centralized pump, we can effectively take blood that's deoxygenated and fill it with oxygen using small chemicals. We can send that good blood out to the body and we can return wastes to the heart where they can be gotten rid of by your respiratory system.

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## Transcript of English Technical Lecture

*with Paul Buttenhoff*

This lecture will focus on the cardiovascular system, one of twelve or so major organ systems in your body. The cardiovascular system is the primary transportation system in your body. When glucose travels around your body from your liver to your toe, for example, it is your cardiovascular system that is responsible. When oxygen travels from your heart to your brain, it is the cardiovascular system that's responsible for that transport also. The two basic components of the cardiovascular system are the heart, which is the centralized pump and then miles and miles of hollow tubes that carry blood, that we technically know as blood vessels, or veins, arteries, capillaries, and several different types. Today, we are going to focus primarily on the heart.

In order to understand the heart, we are going to have to understand first of all what the heart is made of. All organs in the body are made of small living units called cells. The heart is completely made up of living cells known as cardiac muscle cells. These cells are unique because they are found no where else in the body. Cardiac muscle cells, like most muscle cells, have the ability to shorten or contract. There are however, several properties that make cardiac muscles cells relatively unique. First of all, cardiovascular muscles cells are said to be autorhythmic. That's a special property that means they can generate their own action potential, or own electrical activity without relying on the brain or the spinal cord. For example, if a heart is removed during a heart transplant operation, the heart will continue to beat after all connections are severed. We'll talk about this autorhythmicity in a moment. Cardiovascular cells are also able to stimulate adjacent cells. For example, to activate all of the cells in the heart, all of the millions of cells in the heart, its only necessary to stimulate two or three of them. These waves of action potential, or waves of electrical current, can travel to adjacent cells.

The heart is a round organ, roughly the size of a small grapefruit, and it contains four hollow spaces, internally. The walls of the heart are made of these cardiovascular muscle cells, but the internal chambers are known as atria or ventricles. The heart has a couple of different primary functions. It will receive blood that's deoxygenated, that's flowing from the brain for example, or from the pancreas, or from your little toe. The heart will then send that blood up to your lungs so it can saturate itself with oxygen. Blood will return to the heart, and last but not least, the heart has the responsibility of sending this oxygenated blood out to every single tissue in the body.

Deoxygenated blood enters the right side of the heart in the small upper chamber, called the right atrium, and you can see that in the page that I've handed out to you. Deoxygenated blood flows from the right atrium, down through a small one way valve into the right ventricle. Throughout the heart, we are going to find these little one way stop and go systems that are essential for ensuring that blood travels from one direction. Deoxygenated blood then flows from the larger right ventricle, up to the lungs, through a pulmonary trunk, which is essentially an artery, because it carries blood away from the body, but it's unlike most arteries because it carries deoxygenated, or bad blood. The pulmonary artery... arteries, excuse me, pulmonary artery will carry blood up to the lungs, where the blood will circulate in lung tissue and become saturated with oxygen. This is also called the pulmonary loop, as opposed to a systemic loop, which would be any other organ or tissue in the body.



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## Transcript of English Technical Lecture (cont.)

After blood spends a few moments in the lungs, it returns to the heart, except on the left side, and it enters a small upper left atrium. The blood is then returned through structures called veins, although these are going to be unlike other veins that usually carry poor blood, the blood then returns to the left atrium from the lungs, and is the absolute most oxygen rich blood you have in your body. From the smaller right atrium, blood is going to be pumped, down through another valve, into the biggest chamber of your heart, known as the left ventricle. The small valve that protects and ensures that bloods flows down, from the atrium into the ventricle, is also know as the bicuspid, or mitral valve. Often times, because this valve is experiencing great pressure, this valve will give way and blood can actually flow in the opposite direction, which is relatively dangerous is some cases, but is also know as a heart murmur. Once oxygenated blood is in the left atrium, it flows down once again through the bicuspid valve into the left ventricle.

The left ventricle has the most muscle of any of the chambers. It's got the responsibility of getting blood out to the rest of the body. All of your 5 trillion cells absolutely rely on the ability of this chamber to contract. When the left ventricle contracts, it forces blood up and out through a small valve, into the largest blood vessel in your body, known as the aorta. The aorta is then going to send branches up to your brain. The aorta will then send branches down through your thoracic cavity, and eventually down into your legs. The aorta is the largest artery in your body, and it contains oxygenated blood. So, we've got four chambers that work together to push blood into a specific fashion.

What we really have to worry about now, how we regulate those chambers, if the atrium and the ventricle decided to contract independently, blood would not flow effectively, and we would end up with a big mess. The cells in the heart are controlled by the cardiac conduction system. The cardiac conduction system consists of several specialized cardiac muscle cells that function only to carry information. These cells, unlike true cardiac muscle cells, do not contract. In a sense, they are modified nerves, or modified circuits. The primary controller of heart function will be called the sinoatrial node. The sinoatrial node is also sometimes called the pacemaker and is found in the upper corner of the atrium. It's going to be in the upper right corner of your heart. About 100 times per minute, special autorhythmic cells, in the sinoatrial node generate impulses. Every time one of these impulses is generated, the impulse is carried through the heart by all of the cells. If you remember, we said that the cardiac muscles cells have that property, of being able to stimulate adjacent cells. When the sinoatrial node fires, or generates an impulse, because it's closest to the atria, both atria contract almost simultaneously. The two top chambers of the heart work as a unit. When the right atrium contracts, it forces blood into the right ventricle. When the left atrium contracts, it forces blood into the left ventricle. So simultaneously, blood is flowing from the top of the heart into the bottom of the heart.

A split second later, a small delay occurs, and this delay is going to be caused by insulating material. It is going to be most effective to have the heart contract as two separate units, a top unit and a bottom unit. In order to delay slightly the spread of impulses from the atria to the ventricles, there is a layer of connective tissue, between the top half of the heart and the bottom half of the heart that essentially prevents impulses from traveling. However, in order for the cells and the ventricles to be active, they must receive a signal, and this signal will ultimately come, by way of the



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## Transcript of English Technical Lecture (cont.)

atrioventricular node. Basically, in the geographical center of the heart, there is a small group of cells, that will collect impulses that have been delivered from the pacemaker, and direct these impulses down into the larger ventricles. The atrioventricular node, send impulses down through a specialized branch of cells that looks like a small cluster called the atrioventricular bundle. Oftentimes, these bundles do not operate properly, and you end up with what is called a branch bundle block. If these branches in anyway become hindered or inactivated certain regions of the heart cannot be stimulated. Last but not least, from the atrioventricular bundle, impulses are delivered to the discreet minute tissues in the bottom of the ventricles, through small microscopic fibers called Purkinje fibers.

So to review the pacemaker, the atrioventricular node, sets the tone. Impulses are collected by the atrioventricular bundle and delivered down through the Purkinje fibers. Now, by having two separate events, atrial contraction, followed by ventricular contraction, we essentially allow blood to move in a very effective one way circuit. In fact, this is so effective that your heart pumps about 2000 gallons of blood in this way every day. From the heart, blood is going to enter a series of arteries.

Arteries are defined as structures that carry blood away from the heart. That "A" in artery and "A" in away are great clues. As blood flows away from the heart through the series of arteries, specific tissues are supplied by smaller and smaller branches. In order for the heart to operate most effectively there has to be pressure in these vessels at all times. Your cardiovascular system is a closed loop. At no time are you losing large amounts of fluid, or at no time are you gaining large amounts of fluid. Lets talk for just a moment about vessels again. As we said, arteries carry the blood away from the heart, and there is a difference in size between many of these vessels. The largest tubes, and you can think of them as simply hollow tubes, are known as arteries. Arteries branch into smaller hollow tubes, just like the branches of a tree, as you move out from the trunk you get consecutively smaller and smaller. The smaller branches are known as arterioles. Arterioles, finally, branch into the smallest pathways in the system. The smallest pathways are known as capillaries, and they will be special for several reasons. First of all, capillaries are going to be found at sites of exchange in the body. When a tissues needs oxygen, or when a tissue needs to give off carbon dioxide, in order to facilitate that exchange, we must rely on small tubes that things move easily into, and that things move easily out of.

So there are many different sites of exchange in the body. The list of capillary networks is literally endless. After exchange occurs, usually the good things in blood, and I use that term loosely, the good things like glucose and oxygen have been delivered by the cardiovascular system to those tissues. Although most of the work is done at this point, wastes build up in every single cell of your body at every moment of the day. In addition to delivering the nutrients, and oxygen, your cardiovascular system also specializes in delivering wastes away. So if we start at a site of exchange carbon dioxide, a gas, is dissolved in blood, and it continues to go back up to the heart. So this is kind of the second half of the loop. From a capillary network we're going to have... excuse me. Capillaries will emerge to form venules, which are smaller tubes that carry blood toward the heart, and venules will merge to form larger structures called veins, which lead back to the heart.



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## Transcript of English Technical Lecture (cont.)

So I think to review, away from the heart we have arteries and arterioles. Arterioles then branch to form capillaries. After exchange occurs, capillaries will merge to form venules, venules will grow into larger structures called veins, and veins will ultimately be responsible for delivering blood back to the heart.

One of the unique attributes of blood vessels, most of them by the way, is that they do contain a little bit of muscle. So we've got miles and miles of tubes in our heart, and because they contain muscles, they have the ability to change size. Well you ask why would a blood vessel want to change size? It is often advantageous to send more blood through an artery for some emergency, and it become necessary in the case of an injury to send less blood, for example, through an artery. Smooth muscle, the type of muscle that's found in these tissues, have a couple of things that are sort of similar or in common with cardiac cells. First of all, the smooth muscle in your blood vessels is non-voluntary. That is, you cannot consciously think about smooth muscles and cause them to contract. Secondly, smooth muscle cells are also autorhythmic, that means they can generate some of their own action potentials, and most importantly, they can carry those potentials through tissue to adjacent cells. So, we've got this closed system, and we can increase and decrease the size of the tubes that carry blood around from the heart... or excuse me, from the heart back to the heart.

Last but not least, we have to focus just a moment on capillaries. We always find capillaries at sites of exchange, because they are extremely small and delicate. Cardiac tissue is fairly robust in many cases, except when we are talking about capillaries. These are going to be small microscopic tubes, that consist of only one thin layer of cells. Because they are so small and delicate they're potentially damaged very easily and we have to be careful what we do with them. But because they are so small and thin, they readily facilitate a process called diffusion. Diffusion will be defined as the movement of material from areas of high concentration towards areas of low concentration. For example when a tissue's oxygen arrives, oxygen diffuses readily out of these small tissues. When a tissue builds up carbon dioxide and needs to get rid of it, carbon dioxide readily diffuses, moves from areas of high concentration to areas of low concentration, into blood vessels and then carbon dioxide can begin its journey back towards the heart.

So what we see is, to wrap things up, we've got two basic components. We've got a heart that's basically a series of four chambers that work in a coordinated fashion to pump blood out of the body. When blood leaves the body, we've got arteries and arterioles that carry blood towards tissues. Capillaries are unique because they are always found at sites of nutrient and waste exchange. And last, but not least, we've got venules, which become veins that carry blood back up to the heart.



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## Outline of ASL Technical Lecture

*with Kendal Kail*

1.
  - Cardiovascular System, 1 of 12 major organ systems in the body.
  - Glucose travels through body.
  - Oxygen travels to brain.
  - CV responsibility.
  - 2 basic components are: heart "pump" and hollow tubes "carry blood".
2.
  - What is heart made of?
  - All organs made of small living units called cells.
  - Heart made of unique cardiac muscle cells.
  - Several properties make CMC unique – autorhythmic, can generate own action without relying on brain or spinal cord.
  - IE: If heart is removed during a heart transplant operation, heart still beats.
  - Cardiovascular cells are able to stimulate adjacent cells, IE: to activate the millions of cells in the heart, only necessary to stimulate 2 or 3 cells.
  - Heart is a round organ – size of a grapefruit, contains 4 hollow spaces.
  - Walls made of cardiovascular muscle cells, spaces called atria and ventricles.
  - Heart's primary function: receive de-oxygenated blood that's flowing from brain or pancreas or little toes.
  - Heart will send blood to lungs to be saturated with oxygen. Blood returns to the heart. Heart sends oxygenated blood to all tissue in the body.
3.
  - Deoxygenated blood enters R side of heart into the small upper chamber called the right atrium. Deoxygenated blood flows from RA through a valve into the R ventricle.
  - Valves ensure blood travels in one direction. Deoxygenated blood flows to lungs through pulmonary trunk (essentially an artery – "A" for away).
  - Pulmonary artery carries blood to lungs where blood will circulate in lung tissue and saturate with oxygen.
4.
  - Blood spends a few minutes in the lungs – returns to the left side of the heart through the left atrium.
  - Blood goes through the pulmonary vein - \* blood that returns to left atrium is the most oxygenated blood you will find in the body.



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## Outline of ASL Technical Lecture (cont.)

- Blood in LA pumps down through another valve called the bicuspid or mitral valve. Then enters the biggest chamber of the heart - left ventricle.
- Valves experience great pressure. Blood can flow back through the valve – can be dangerous – called heart murmur.
- LV has the most muscle of any chamber, responsible for pumping blood out to the entire body.
- 5 trillion cells rely on the ability of the LV to contract, when it contracts, blood goes through a small valve into largest blood vessel called the Aorta.
- Aorta send branches to the brain, to the thoracic cavity, and to the legs.
- Aorta is largest artery in the body.
- 4 chambers work together to pump blood.
- If A and V decided to contract independently – blood flow would be ineffective.
- Cells in the heart are controlled by the cardiac conduction system.
- CCS function - carry information. Does not contract.
- Primary controller of heart function is the sinoatrial node.
- SA node is sometimes called the pacemaker.
- Found where? Upper right corner of heart.
- SA node generates impulses.
- When SA node fires or generates impulses, the atriums contract.
- When RA contracts blood goes to the RV, LA contracts blood goes to the LV.
- Blood flows from top of heart to bottom of heart.

5.

- A split second later, small delay occurs, caused by insulating material.
- Heart must work effectively to contract as 2 separate units, top unit and bottom unit.
- Spread of impulses from atria to ventricles is delayed a bit.
- Insulating material between the top half of heart and the bottom half of the heart prevents impulses from traveling.
- In-order for the cells of the ventricles to activate they must receive a signal from the atrioventricular node.
- A small group of cells collect the impulses from the pacemaker and direct impulses down to the ventricles.
- AV node sends impulses to atrioventricular bundle, if this does not happen correctly then get what is called branch bundle block and heart cannot be stimulated.

6.



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## Outline of ASL Technical Lecture (cont.)

- AV bundle, send impulses to the bottom of the ventricles through small microscopic fibers called Purkinje fibers.
- SA node and AV node set the tone. Impulses are collected by the AV bundle then delivered to the Purkinje fibers.
- 2 separate events, atrial contraction then ventricular contraction. Allows blood to move very effectively in 1-way circuit.
- Fact, heart pumps about 2,000 gallons of blood in that way every day.
- Arteries carry blood away from heart. Many different sizes of vessels. Largest tubes = arteries, become smaller and are called arterioles.
- Smallest pathways are called capillaries. Found in sites of exchange.
- Capillaries exchange wastes and nutrients in all tissues of the body.
- Review - away from heart, arteries and arterioles. Arterioles then branch to form capillaries - exchange occurs merge with venules, which become veins and go back to the heart.
- One of unique thing about blood vessel, they have a lot of muscle tissue.
- They have ability to change size. For example: more blood emergency, less blood injury.
- Smooth muscle found in tissues (same as cardiac cells) and is non-voluntary and autorhythmic.
- Tubes that carry blood from heart and to heart can increase or decrease in size.
- Capillaries are extremely small and delicate: consisting only of one thin layer of cells.
- Can be damaged very easily.
- Diffusion defined – movement of materials from high concentration area to low concentration area. Blood exchanges CO<sub>2</sub>/oxygen through capillaries.
- 2 basic components: heart with 4 chambers working together to pump blood.
- Blood leaves heart. Its arteries and arterioles carry blood to tissues. Capillaries are unique, always found at sites of waste exchange. Last we have venules, become veins to carry blood up to the heart.



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# Roll the Credits

This project was a collaboration of many people's minds and talents and we wish to acknowledge them here.

**Instructors/Language Models:**

Paul Bутtenhoff

Kendall Kail

**Interpreting Model:**

Patty McCutcheon

**Computer Design/Editor:**

Doug Bowen-Bailey

**Producer:**

Todd Tourville

**The Staff of the RSA Region V Interpreter**

**Training Project:**

**Adminstrator:**

Laurie Swabey

**Project Managers:**

Paula Gajewski

Richard Laurion

**Adminstrative Assistant:**

Darla Barrows

*The producer wishes to extend his heartfelt gratitude to Patty McCutcheon for allowing us the opportunity to record her work to share with all of you. I would also like to thank Kendall Kail and Paul Bутtenhoff for helping us make this project a reality and for giving us the inspiration to continue this work. It is the desire of this project to make this the first in a series of lectures available relating specifically to Anatomy and Physiology in a college setting. Also, I must thank Doug Bowen-Bailey for his Computer and Design expertise. Without him I would only have a pile of videotapes and typed speeches.*

September 2001

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# RSA Region V Interpreter Training Project Fact Sheet

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## What is the Focus of this Project?

The goal of the Rehabilitation Services Administration (RSA) of the U.S. Department of Education is to make available, through ten regional grants, support for continuing education for interpreters who work with Deaf, hard of hearing and DeafBlind people. The ultimate goal is to increase the number of certified, qualified interpreters in post-secondary and employment related settings.

The goals of the training project for Region V include:

- \* Building an infrastructure in rural and urban areas across the region so that the long-term on-going need for skill maintenance and skill upgrading can be met in local areas. Some components of this include a comprehensive local and regional resource guide for interpreters and agencies, mentor development & training and independent study materials for interpreters.
- \* Continuing to provide a source of qualified interpreters who have graduated from the College of St. Catherine's four-year interpreting program, which includes specialized areas such as deaf-blind, health care and educational interpreting. These specialized courses will be offered in an intensive summer format to make them available to interpreters throughout the region. In addition, the goal has been set to see an increase of least 10% in the number of minority students/students from diverse communities completing the program.
- \* Co-Sponsoring 42 workshops per year in Region V, responding to previously identified needs as well as immediate and/or on-going needs, such as preparation for certification and developing interpreting skills for working with individuals who are DeafBlind or who have low vision needs. Co-Sponsoring may be in the form of information & referral, technical assistance, advertisement and/or a contribution to the presenter's fees/expenses.

## Which states does Region V cover?

Region V includes the states of: Illinois, Indiana, Michigan, Minnesota, Ohio and Wisconsin.

## What type of support is available?

**Technical Assistance:** This includes assistance with any or all steps in planning and coordinating an event: locating presenters, assistance with timelines and detail work, registration coordination, fiscal coordination, advertising (including the development and mailing of flyers), printing of materials, evaluation development and summaries.

**Financial:** First consideration for financial support will be given to those projects that address the underserved populations identified by the Federal RSA or the Project Needs Assessment. This includes (but is not limited to) interpreters working in rural areas, interpreters working with individuals who are DeafBlind; distance-learning programs, mentoring and increasing the number of certified interpreters from diverse communities.

**RID CEU sponsorship:** Assistance with completing the necessary paperwork for approving CEU sponsorship for events throughout the region. As an approved sponsor, we can also be the identified sponsor of the CEUs for the event and take care of the necessary paperwork for application, documents for the event, and certificates of attendance.

**Information and Referral:** This includes providing contact information to individual interpreters for professional organizations, websites and other resources that may be helpful in general interpreting skill enhancement.

Any or all of the above mentioned kinds of support may be given to any project.



# Mirrored Math

## RSa Region V Interpreter Training Project Fact Sheet (Continued)

### How will awards for support, particularly financial support, be decided?

The non-financial support is readily available to anyone – simply give us a call or send us an email at least 2 weeks prior to your event, or 45 days prior if you are requesting CEU’s, and ask us if the support you are looking for is within the scope of the Project and can be available for your event.

Organizations requesting financial support will be required to complete and submit to the Project office a simple application. Applications for funding will then be sent to at least three reviewers. They will be given a set of criteria, including the goals of the Project and region, and will make recommendations for whether or not this event should be approved for funding.

### How much financial support is available?

Financial support will generally be in the form of Challenge Grants. We have funding available for 7 events per state, each of the five years of the project.

*What are the criteria considered by the reviewers of the Challenge Grant applications?*

The criteria includes:

- \* Which needs identified for this state and region does this event address? (The more needs addressed the better!)
- \* What partnering agencies and organizations are identified for working on this project? (Again, the more the better!) What kinds of contributions are being made by the partnering agencies, either financial or in-kind?
- \* Based on the budget submitted, does this look like a fiscally sound project? (Is it reasonably priced for attendees? Do the costs outlined seem appropriate for this size event?)

### Can I apply at any time for financial or other support?

The applications for financial support will only be processed and reviewed on a monthly basis. Applications must be received in our office by the 5th of the month (or the closest business day to the 5th if it falls on a weekend) to be considered that month. Notification for awards will be given to applicants by the 30th of that month. Applications will not be accepted after an event has occurred.

### What must I do once support is granted?

If the Project is co-sponsoring an event, by providing technical assistance, CEU sponsorship, and/or financial support, the grantee must provide the Project with a class roster, final budget, invoice and evaluation summary (if we are not doing the summary for the event) within 30 days of the events completion. The Project must be identified as a co-sponsor on all advertisements with the following wording:

*This Workshop is Sponsored in Part by Region V ITP Award #H160A000008 at the College of St. Catherine in Partnership with SLICES, LLC*

### Who is staffing the Project?

Darla Barrows is the Administrative Assistant and can be reached Monday – Friday, 8:30 – 4:30 p.m. Richard Laurion and Paula Gajewski of SLICES, LLC share the position of Project Manager. Laurie Swabey, the Director of the Interpreting Program at the College of St. Catherine, is the Project Administrator.

### How can I get more information?

**Federal Interpreter Education Project**  
**College of St. Catherine**  
**601 25th Avenue South**  
**Minneapolis, MN 55454**  
**651-690-7779 (V) 651-690-7869 (TTY)**  
**Fax: 651-690-7849**  
**E-mail: [federalprojectinfo@stkate.edu](mailto:federalprojectinfo@stkate.edu)**  
**<http://www.stkate.edu/project>**

