Welcome to this lesson on blood vessels.

In this lesson today we will be classifying the various types of blood vessels, depending on their structure and their function.

To start off, we're just going to basically define what a blood vessel is, in general. Blood vessels are just tubes that transport blood. Blood vessels have an important role in our body, because they can help manage our blood flow and our blood pressure with the contraction or relaxation of the smooth muscles that surround them.

There are various types of blood vessels within our body, and we're going to be discussing those today.

To start out, we're going to take a look at this diagram right here. We're going to use this to explain the different types of blood vessels found within our body. I'm actually zoom in just a little bit to make this diagram a little larger.

We have our heart labeled here in the middle, and we have a couple different types of blood vessels that carry blood away from our heart, and we have a couple different types of blood vessels that return blood to our heart.

One of the types of blood vessels that carries blood away from our heart are arteries. An artery is a blood vessel that carries blood away from our heart, and it has a large diameter.

Arteries are made up of several layers, which include a layer of connective tissue, some smooth muscle-- which again, can contract or relax to manage blood flow and pressure-- and it also has a layer of endothelium. Arteries can pump high pressure blood from the heart, and they also have these stretchable walls, which offers little resistance to blood flow. So therefore, within arteries there's usually a stable pressure.

If you've ever taken your pulse before, if you've ever went for a jog or exercised and then measure your pulse afterward, what you're actually measuring, or what you're actually feeling, is the pressure surge in arteries when the ventricles within your heart contract. You can feel your pulse at different parts of your body. On your wrist, by your carotid artery near your neck. So you're feeling that serge of pressure when your ventricles contract. So arteries are a type of large blood vessel that carries blood away from the heart.

Our next type of vessel that carries blood away from the heart is arterials. So an arterial branches-- or an artery will branch, I'm sorry-- into a narrower arterial. So we start with arteries that have our large diameter, and then branch into these arterials, which have a smaller or narrower diameter. Arterials are made up of a couple different layers, as well. This includes a layer of smooth muscle, and a layer of endothelium. Arterials can dilate or constrict, again, because of that smooth muscle. So that smooth muscle can contract or relax, allowing the arterial to dilate or constrict. Arterials offer a little bit more resistance to blood flow than arteries.

Our next type of blood vessel are capillaries. So arterials will branch into these even smaller capillaries, and capillaries are tiny vessels that are found in capillary beds, which is basically like an interlacing network of capillaries. So they're composed of just one thin layer of endothelium, and this allows for substances to easily diffuse between blood and tissues. Because this one layer of endothelium is very thin, so diffusion occurs very easily.

Blood moves very slowly in capillaries. It actually moves very, very slowly capillaries. But because of the amount of capillaries in our body, they offer less resistance to blood flow than arterials. So capillaries branch all over throughout our body and we have-- the amount of capillaries we have compared to any other vessel, we have the most capillaries. So because we have so many of them, there's less resistance to flow than some of our other vessels.

Our next type of blood vessel are venules. So venules now-- capillaries will start to move blood back into venules, and venules start to return blood back to the heart. So capillaries will merge with these venules. But venules also have thin walls. Because of the thin walls of venules, some substances can still continue to diffuse across in venules, as well. So diffusion is not just happening in capillaries-- this is where most of our diffusion occurs-- but a little bit of diffusion can also occur in venules as well, as blood is starting to be returned to the heart.

And then we have, finally the veins. Veins have a larger diameter than venules. So we have the small diameter in venules, and then we're going up into a larger diameter with veins. Veins, as I mentioned, have a larger diameter. They have low resistance, but a unique thing about veins compared to some of our other vessels is that veins actually have these valves that prevent back flow.

I'm now going to move to this diagram right here, because this diagram deals specifically with veins. This is a diagram of a vein. It has this layer of connective tissue, smooth muscle, endothelium, and then it also has this valve here. So because we're going against gravity, veins have these valves that prevent back flow. So blood can flow through the vein, but it can't flow back. It's a one-way direction that blood can flow in these veins.

The contraction of the smooth muscle equals stiffer walls of the vein, which equals a rise in pressure, which equals more blood flow to the heart. So these smooth muscles, as I mentioned, play a large role in managing blood flow and pressure. So when you're exercising, for example, those smooth muscles will contract. And then, as I said, that will cause the walls of the blood vessels to stiffen. Blood pressure will rise, and then more blood will be delivered to your heart more quickly. So again, one more time, our overview of blood vessels. We have arteries and arterials which deliver blood away from the heart to the tissues. Capillaries act as an area of diffusion, and then venules and veins will return deoxygenated blood back to the heart.

This lesson has been an overview on blood vessels.