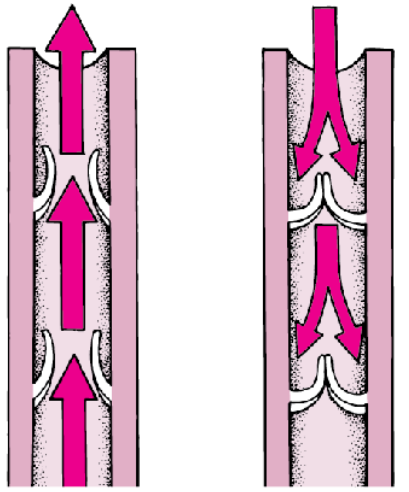
Varicose Veins

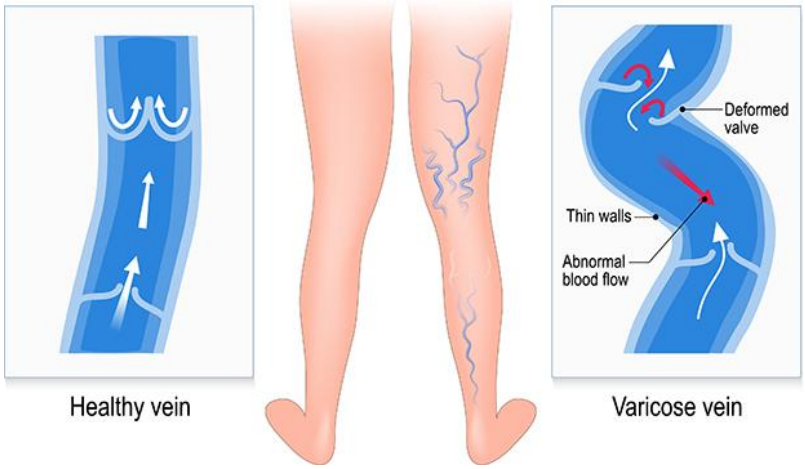
Dear Grandma,

I heard that you have started to spot some varicose veins in your legs. You're in luck because I have been learning about varicose veins in my Human Body Systems class. First, I'm sure you're wondering exactly what the purpose of veins are in your body and how they differ from arteries. You obtain oxygen from the air around you, which enters the body through the respiratory system. It enters the cardiovascular system through the capillaries. Your heart pumps oxygenated blood throughout your blood through the arteries, which are located deep below the skin. Blood is being pumped with such force and pressure that your artery walls are extremely thick, much thicker than the walls of your veins. Veins carry deoxygenated blood from various areas in the body back to the heart. Veins are much thinner, and as you see, they are located much closer to the surface of the skin. Your veins do not have one powerful pump like the heart; blood is pushed through the veins with force from your muscles. The muscular system plays an extremely important role in this. For example, in your leg, the movement of your leg muscles powers blood to be carried upwards towards the heart. However, you're probably wondering how blood can be pumped upwards against gravity. This is because the veins have valves which prevent blood from flowing backwards. Once blood is forced in an upwards direction, the valves ensure that it stays moving in this direction.



Valves Open Valves Closed

Well, how does this connect to why you are starting to notice varicose veins? Over time, your valves start to weaken, especially if you spend most of the day on your feet. Most aging people start to notice that their veins are bulging out of their leg at a certain point. This is simply because the valves have been weakened too much that they are no longer able to prevent blood from flowing backwards. When this happens, blood starts to clump in certain areas of the veins. This gives your veins an odd shape, which is why you are starting to notice them in your legs, exactly how it is shown in the image below.



I'm sure you are still wondering why you only notice this in your veins and not your arteries. There are several reasons for this. First, for the most part, arteries are not working against gravity. Blood flows from the heart and mainly downwards throughout the body. As a result, there are no valves in arteries. Also, the walls of your arteries are much thicker and can stay in better shape during the body's aging process. Another main reason for this is because the heart is a very powerful pump which prevents blood from ever flowing backwards.

I hope this answers your questions and that you now understand what is happening in your body to form varicose veins.

Sincerely,
Nora

- **Conclusion Questions 1-3**

1. **Which artery do you think is made of thicker muscle, the aorta or the pulmonary artery? Why? Refer back to your heart box to visualize the path of these vessels.**

The aorta is made of thicker muscle due to its function. It must send blood throughout the body which is a very long distance. On the other hand, the pulmonary artery only has to transport blood to the lungs. A longer distance of transportation requires more protection, which is why the aorta requires a thicker muscular layer.

2. **Describe two ways blood is helped back to the heart in veins. Mention relevant body systems.**

Blood is transported back to the heart through the veins. Since the veins do not have a powerful pump like the heart, the muscular and skeletal system help to power blood through the veins and back to the heart. The superior and inferior vena cava allow blood to be taken back inside of the heart once it reaches this point.

3. **Explain why a person who spends most of the day on his/her feet is more likely to develop varicose veins.**

Someone who spends the majority of the day on their feet is more likely to eventually develop varicose veins because they are constantly subjecting their body to gravity. Veins are constantly fighting against gravity in order to pump blood back to the heart, so if someone were to increase this effect on their body, the likelihood that they would eventually develop varicose veins would increase.