

Your heart is an extraordinary machine.

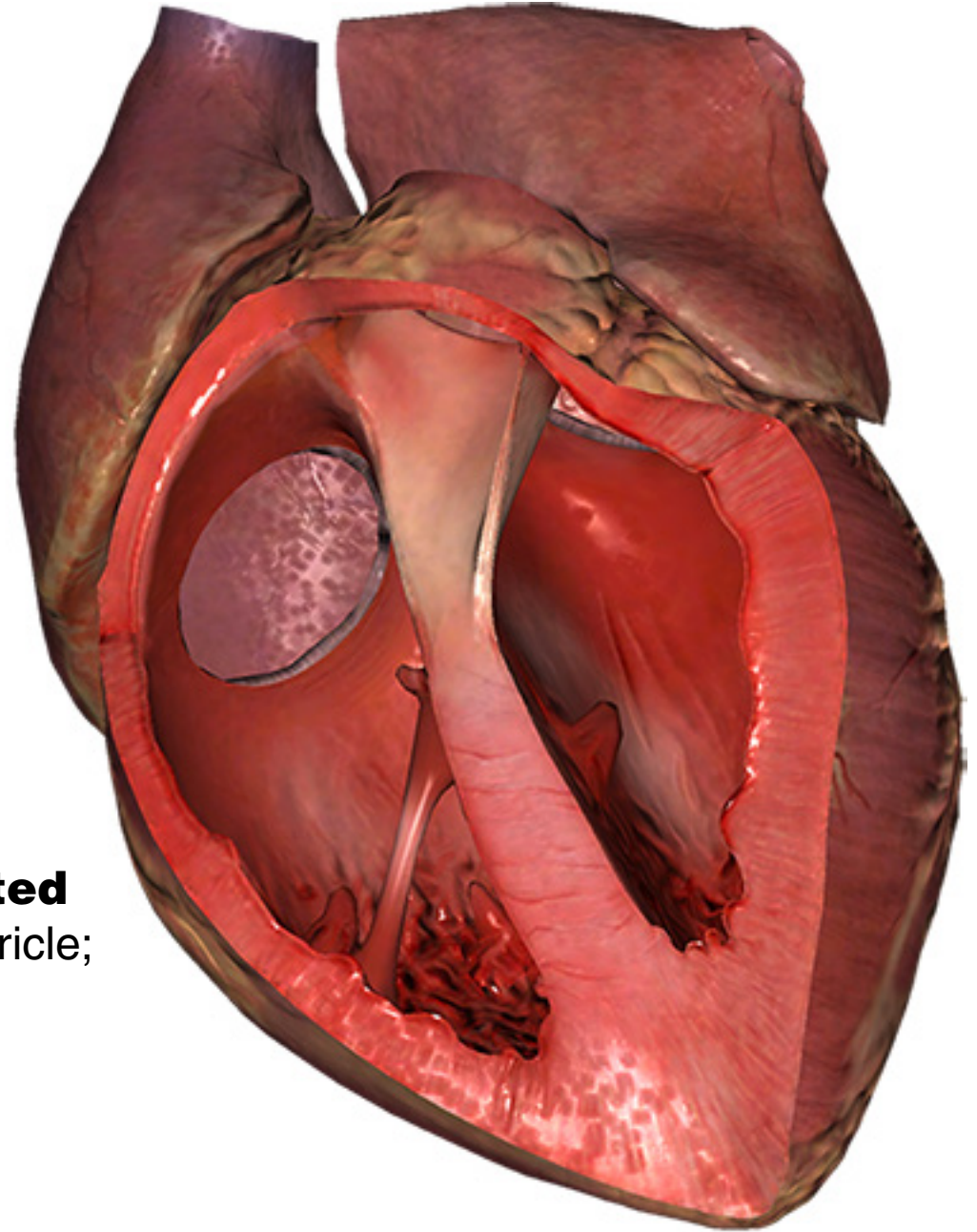
And like any machine, the heart has several layers that enable it to operate.

Let's take a look at what you need to build a circulatory system.

The most basic component of the heart is its role as a four-chambered **muscle**.

The top two chambers are the **atria** and the bottom two are the **ventricles**.

The right atrium receives **deoxygenated blood** and empties it into the right ventricle; the left atrium empties **oxygenated blood** into the left ventricle.

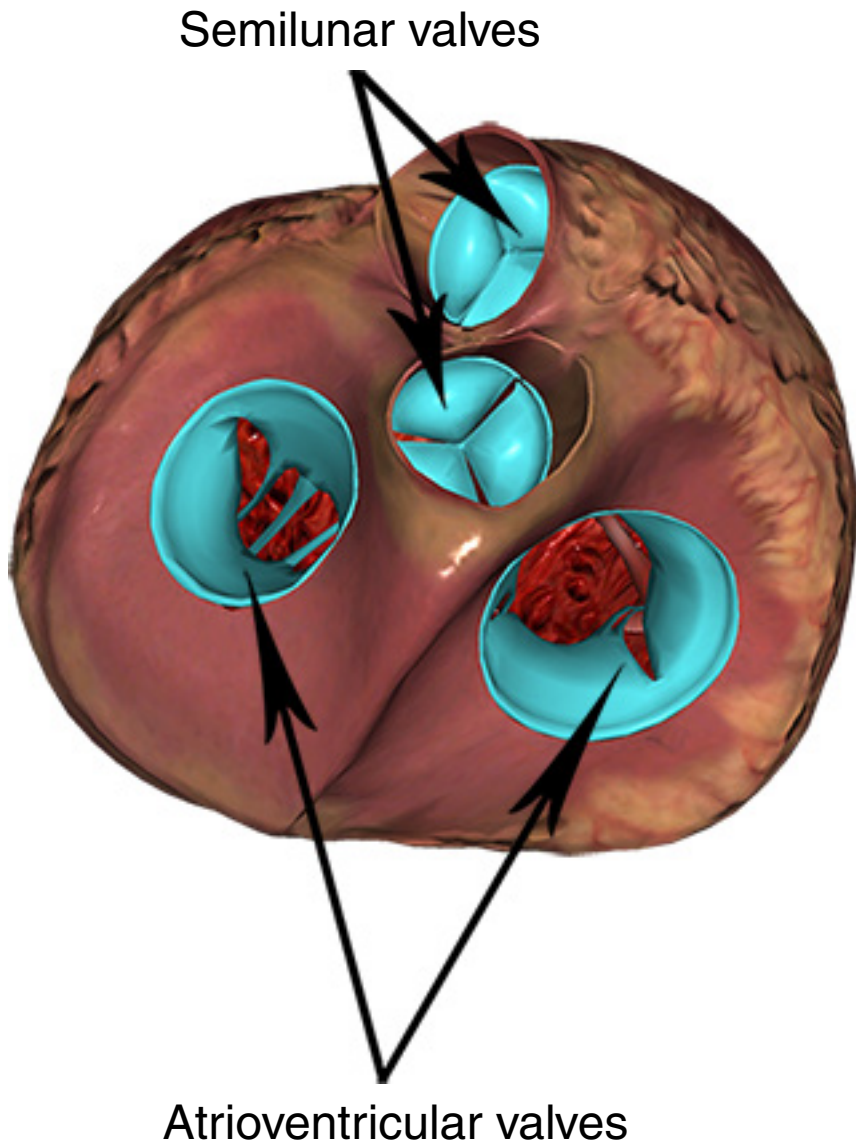


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In order to pump blood in and out of the chambers, the heart needs **doors**.

The heart's **valves** open and shut, **regulating** the amount of blood that enters and its destination.

The **atrioventricular valves** control the blood flow into the two ventricles, and are pulled open and closed by fibrous cords called **chordae tendineae**.

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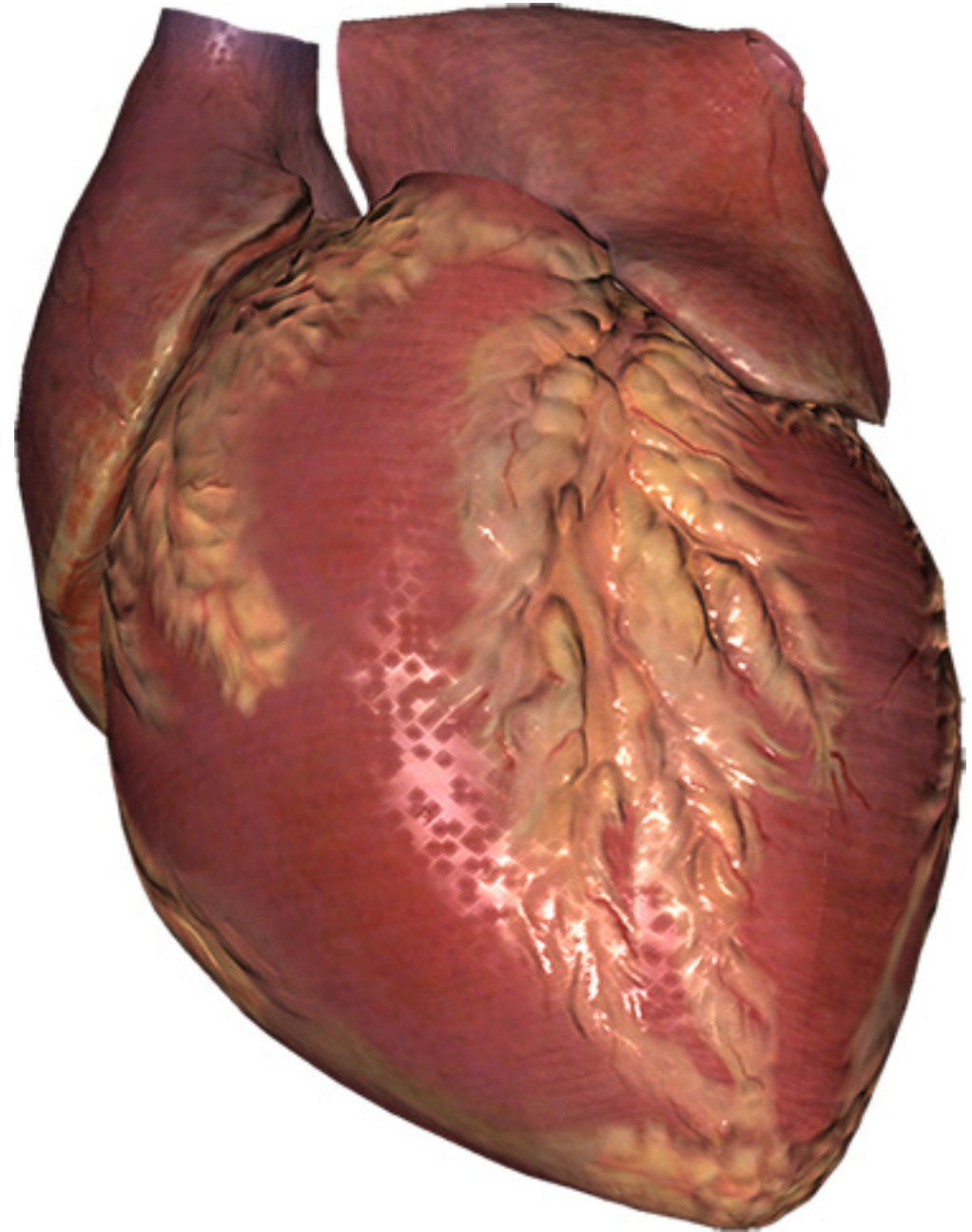


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The external surface of the heart is also known as **epicardium**, and is covered by **fat**.

Factoid: It is completely normal to have some fat on the surface of the heart.
(It's when the fat builds up that there's a problem.)



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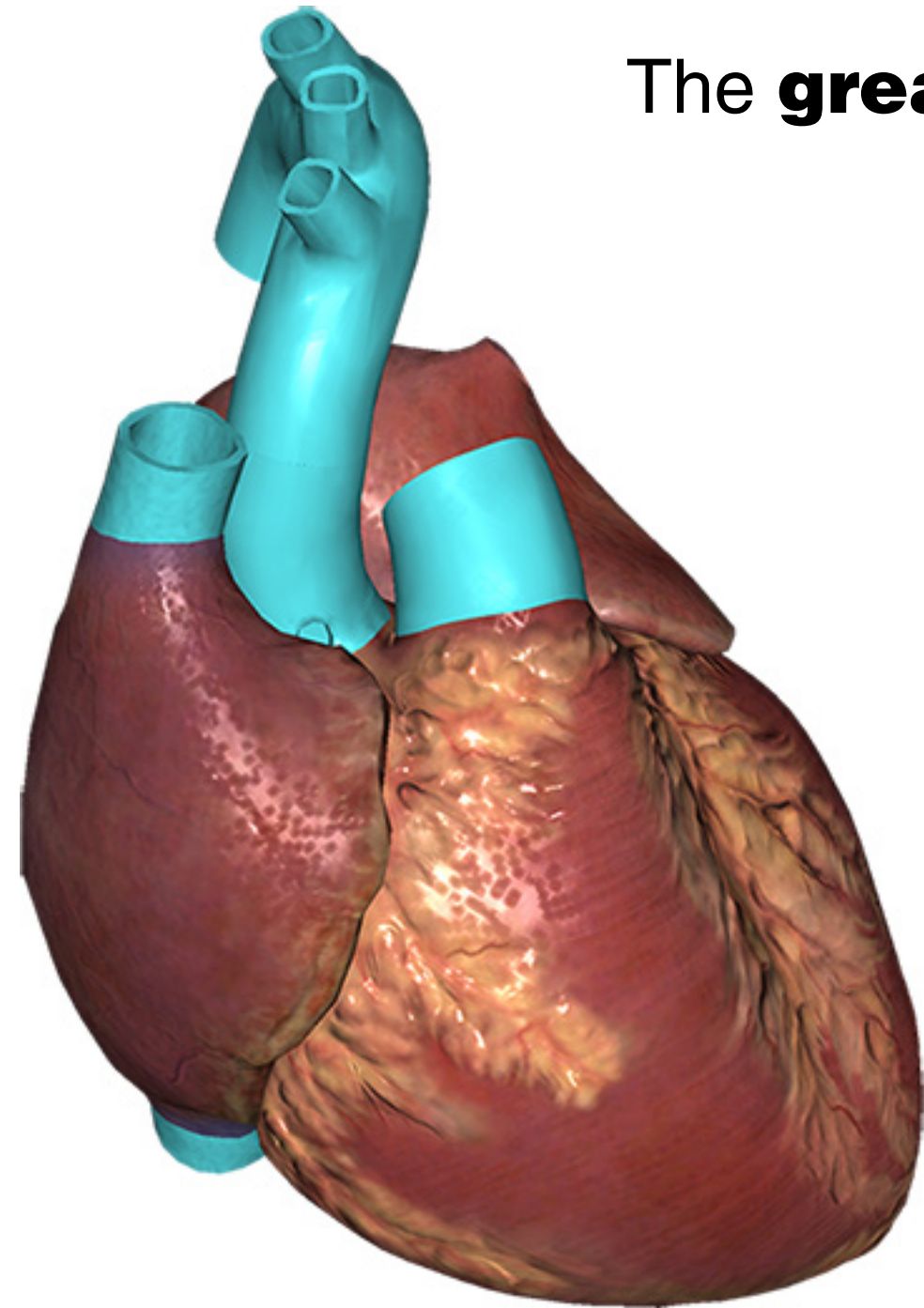
The **great vessels** of the heart are:

The aorta

The pulmonary trunk

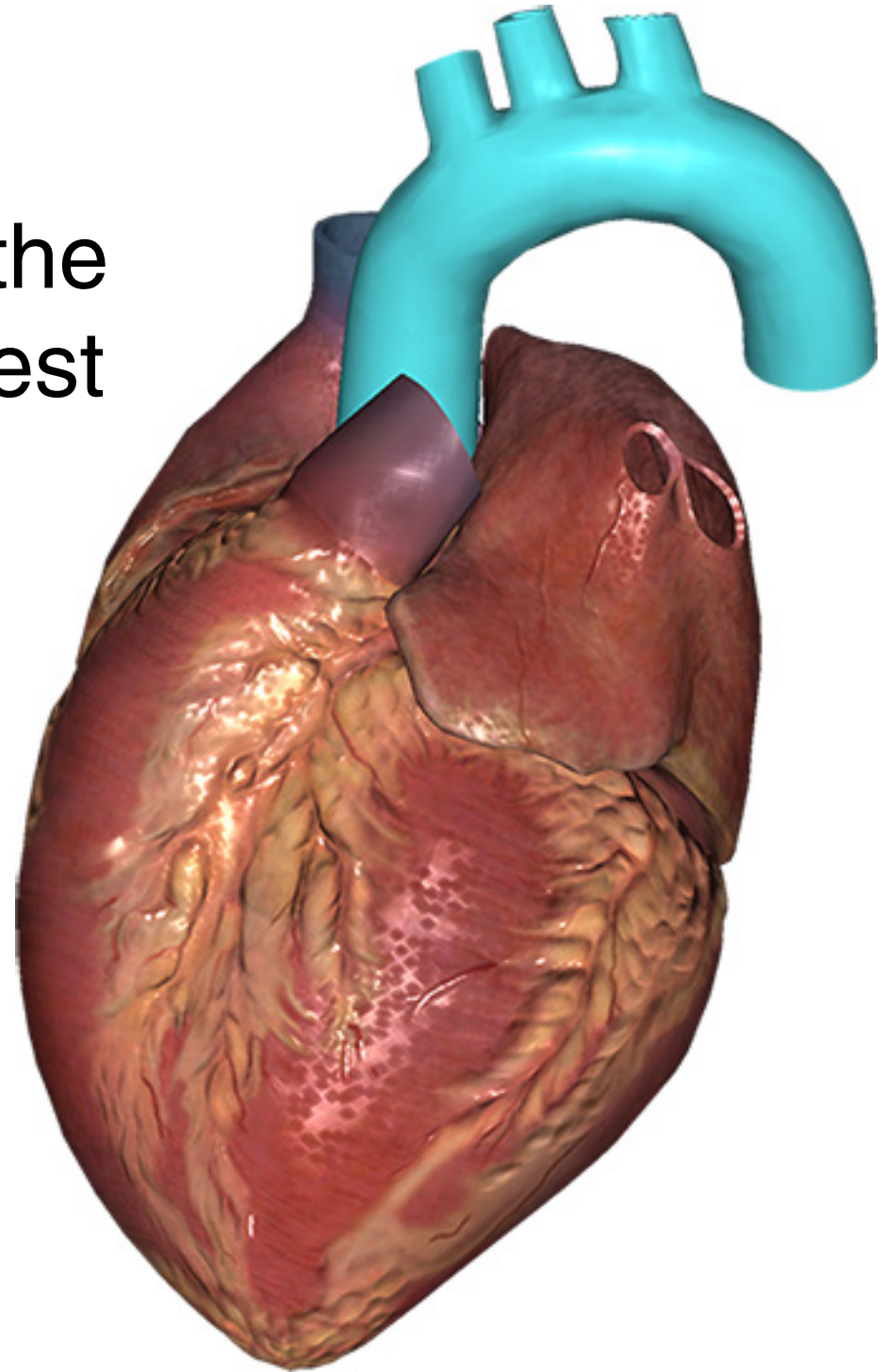
The vena cavae

They connect the heart to the **arteries** and **veins** that distribute blood throughout the body.



The **aorta** delivers oxygenated blood from the **left ventricle** to the rest of the body.

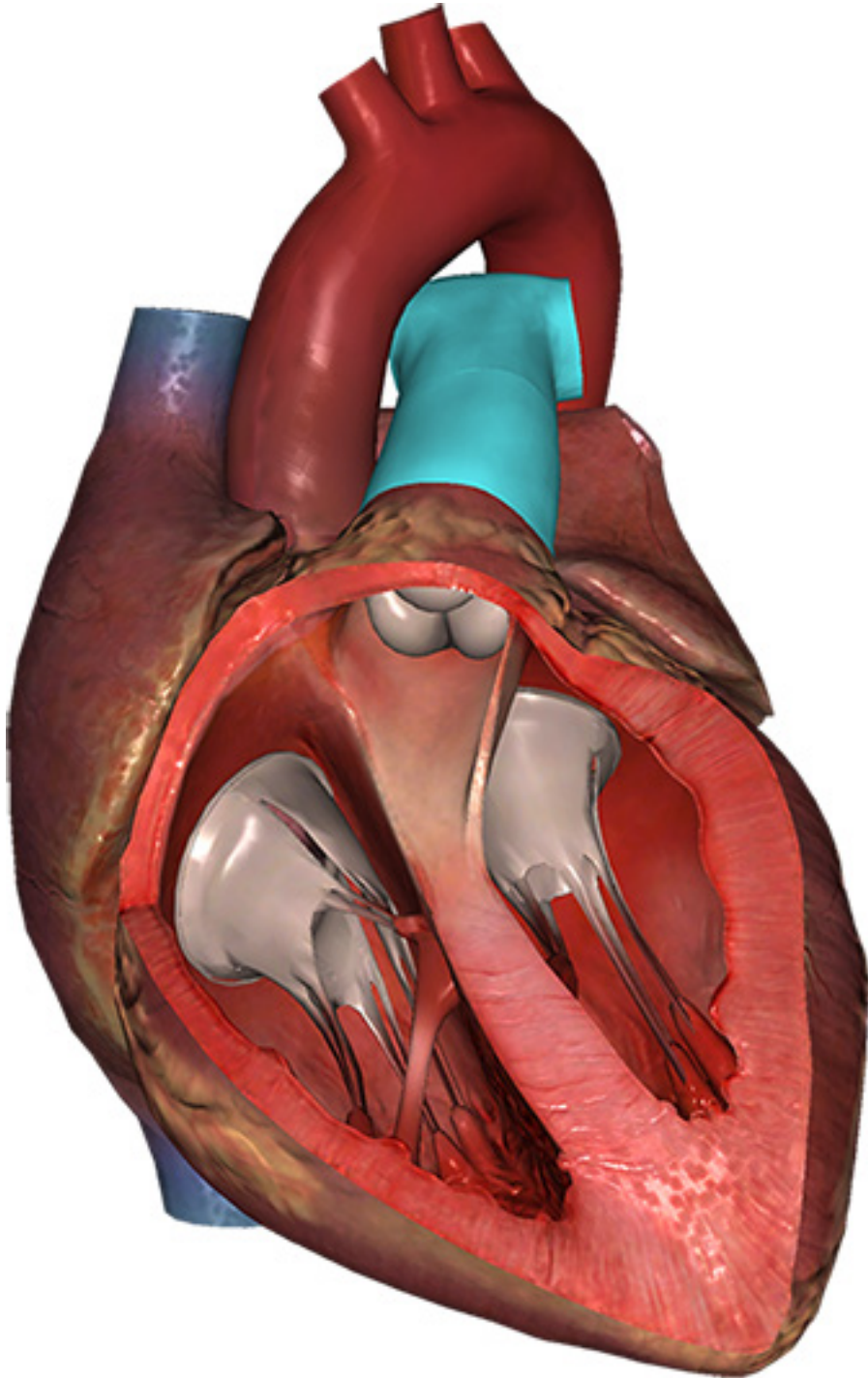
Factoid: The aorta is approximately 2-3cm in diameter. It's thicker than a standard garden hose!



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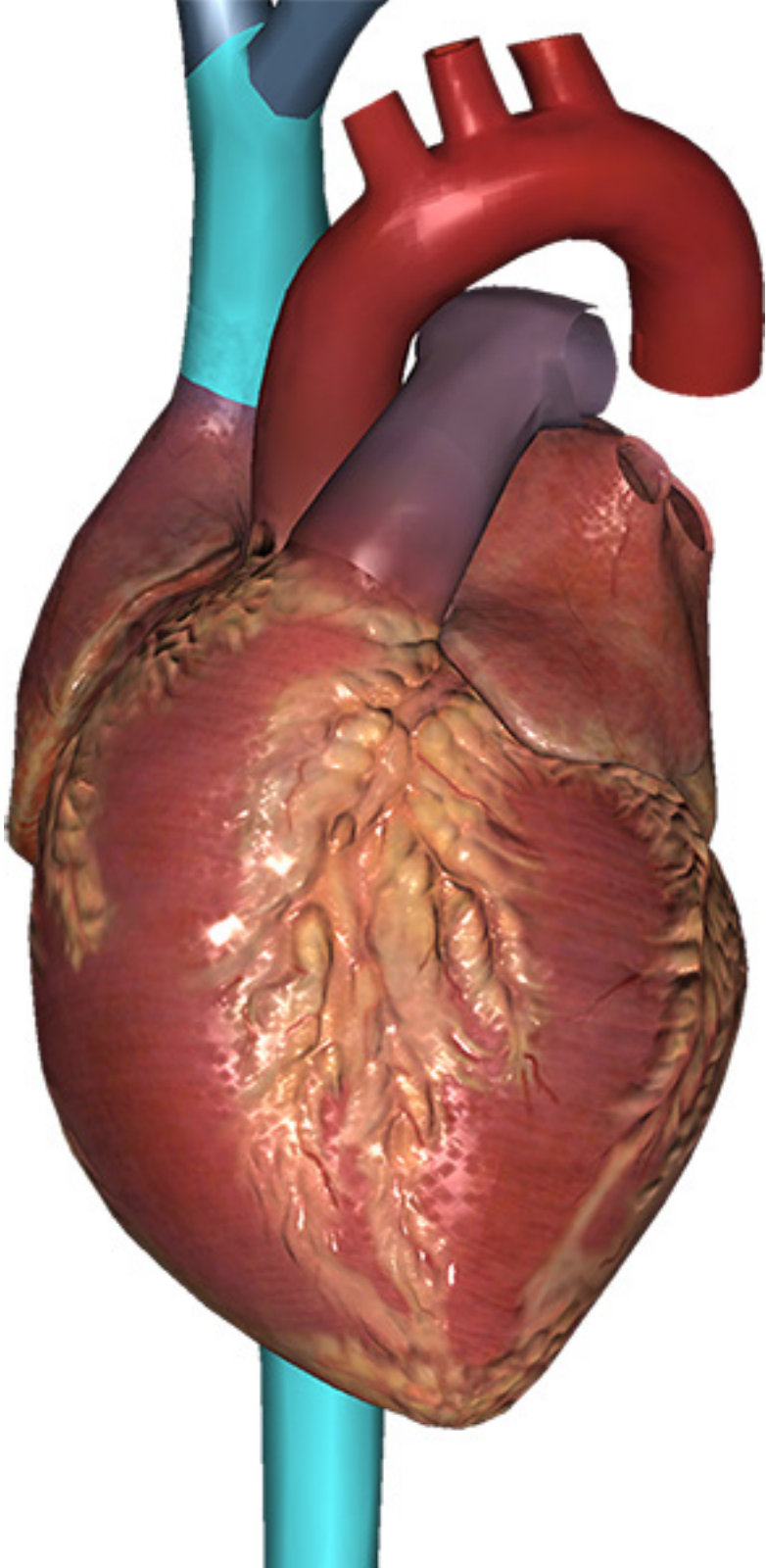


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The **pulmonary trunk** delivers deoxygenated blood from the **right ventricle** to the **lungs**.

At the aortic arch, the pulmonary trunk splits into the **pulmonary arteries**, which extend into the lungs. The pulmonary arteries are the only arteries in the body that carry **venous blood**.



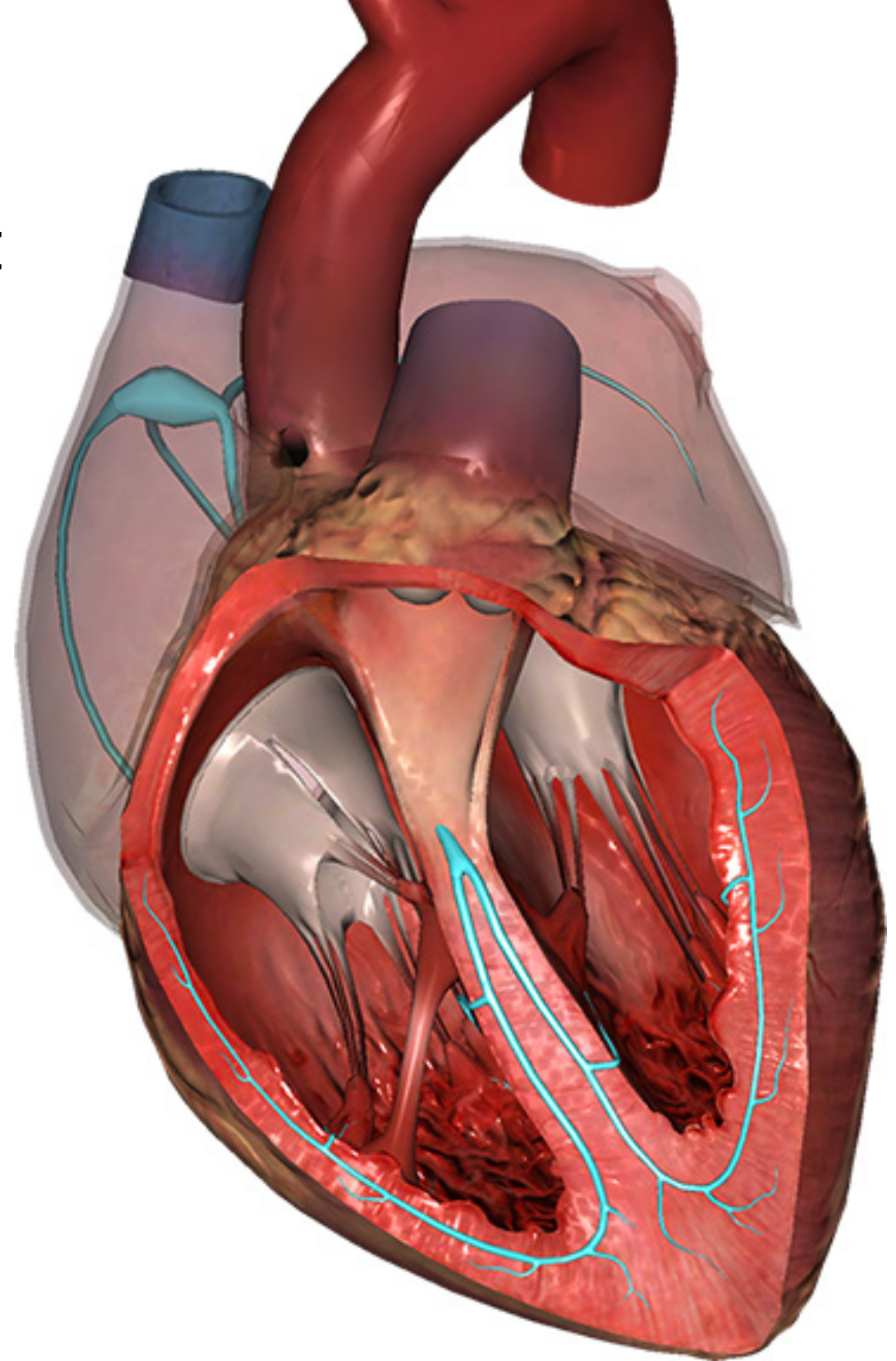
The **vena cavae** deliver deoxygenated blood from the top and lower halves of the body, respectively, to the **right atrium**.

Factoid: The vena cavae are the largest veins in the body.

The heart's **conduction system** does exactly what it sounds like: it conducts **electricity** throughout the heart.

The pulses of electricity motivate the heart to contract, or **beat**.

The pathways of the conduction system are made up of **bundles** and specialized **muscle fibers** within the heart. Electrical signals move down these pathways.



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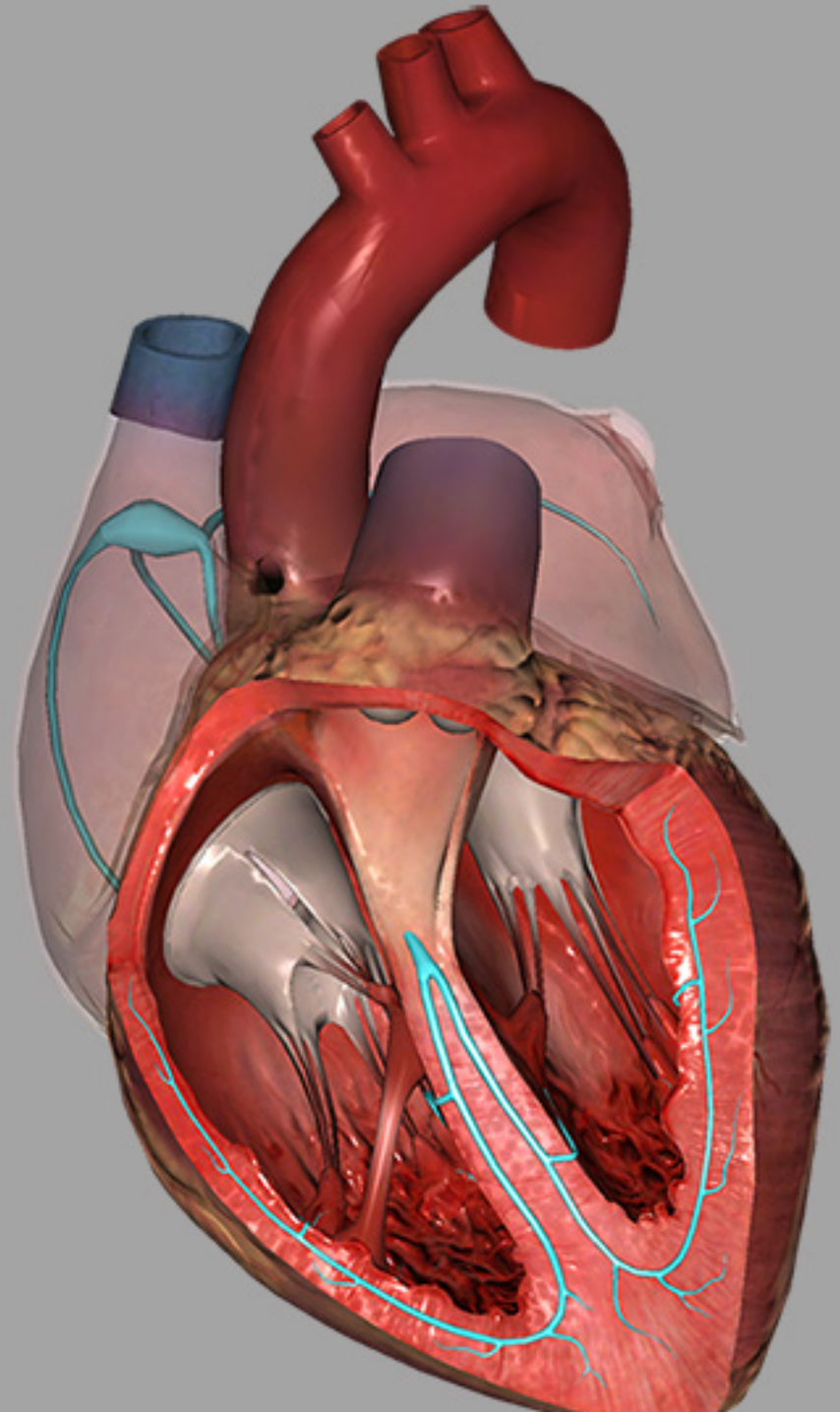
Let's take a break and recap.

The heart has:

- 4 chambers
- 4 valves
- 4 great vessels

The conduction system motivates the heart to pump blood.

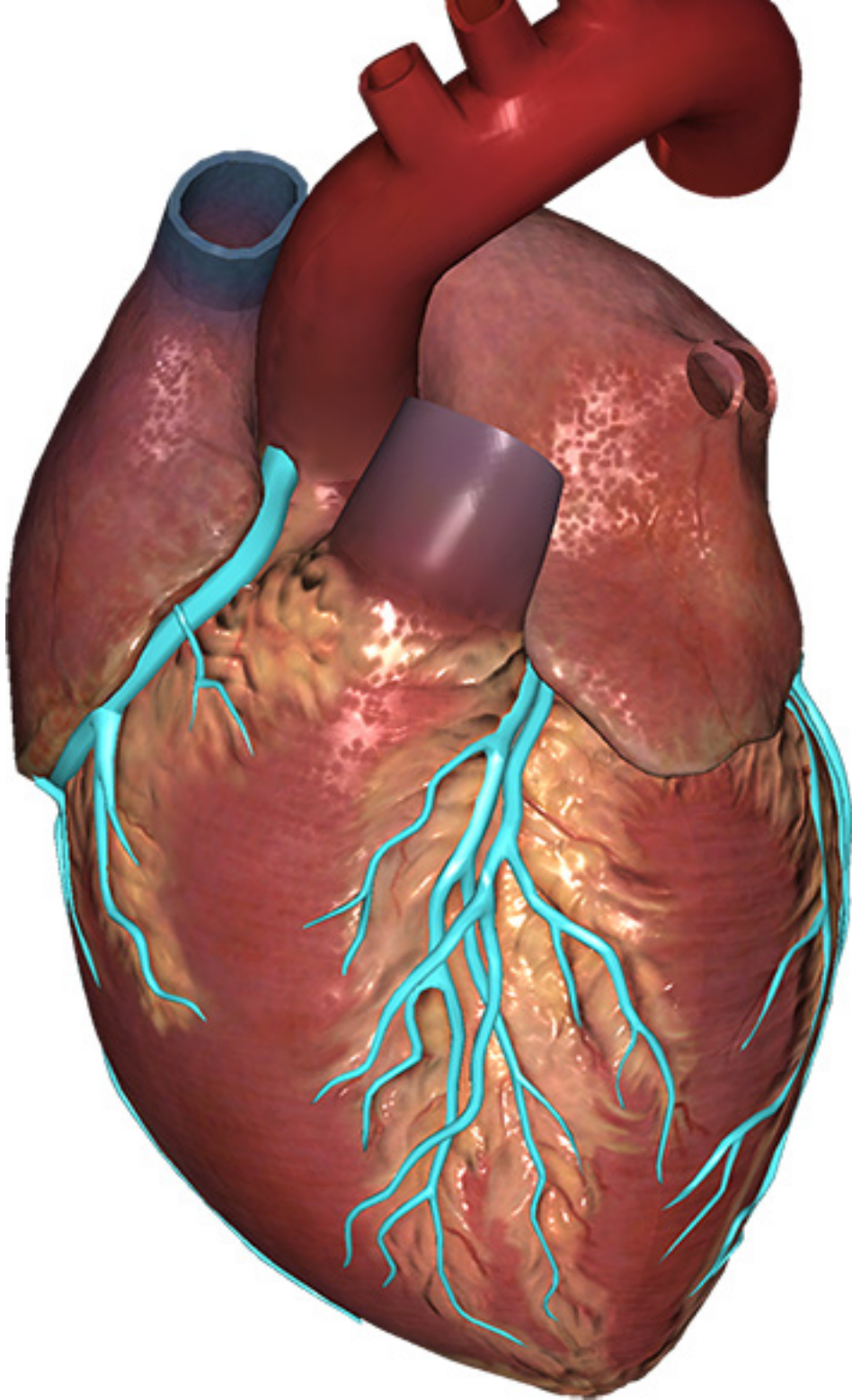
But **where** does that blood go?



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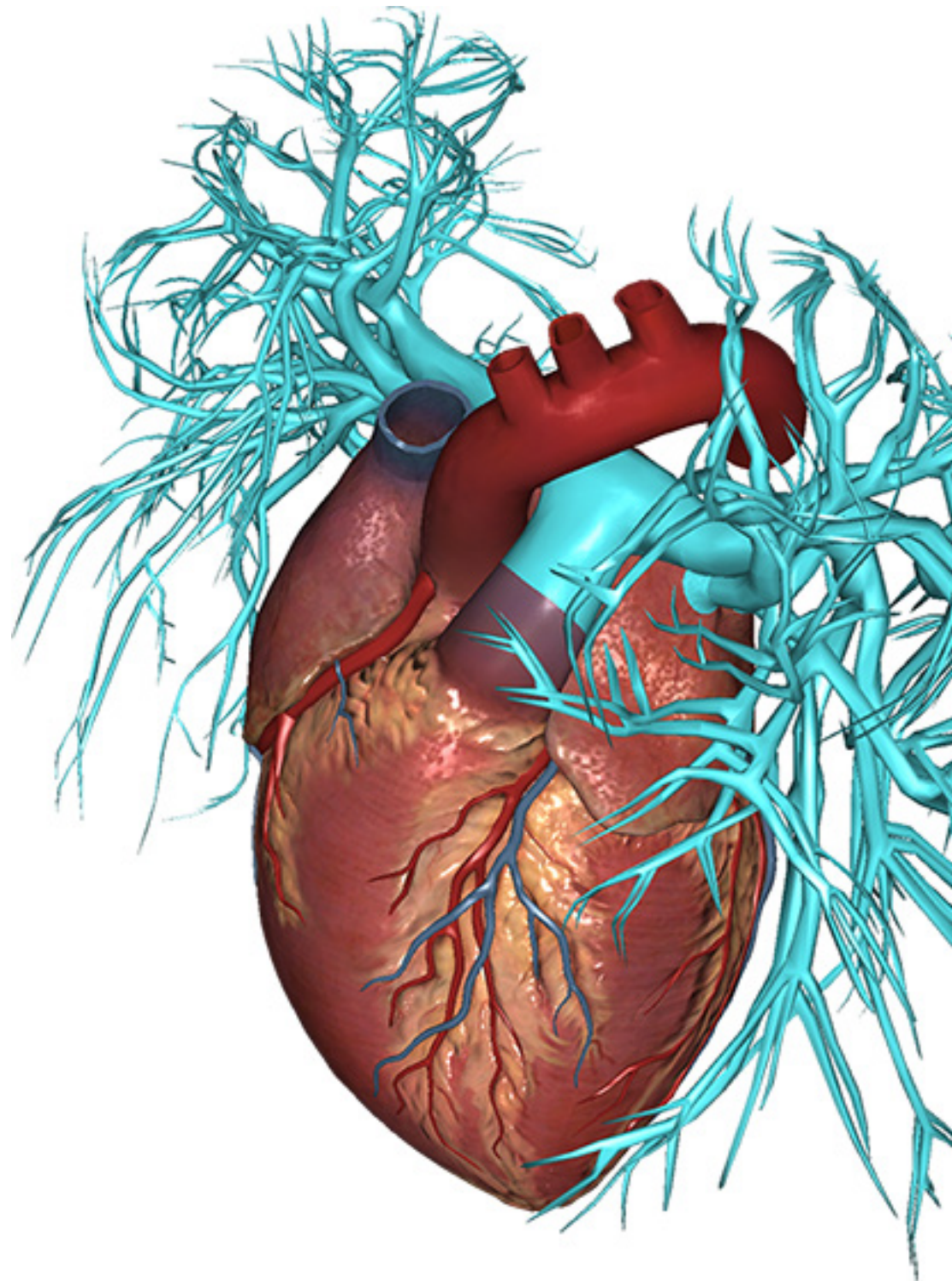


Not only does the heart provide blood for the body's organs and tissues, but also for **itself**. The **coronary vessels** supply blood to the heart.

The arteries **supply** the heart with blood, while the veins carry **deoxygenated** blood from the heart tissue into the **right atrium**.

The **pulmonary vasculature** manages the passage of blood between the heart and the lungs, as well as **gas exchange**.

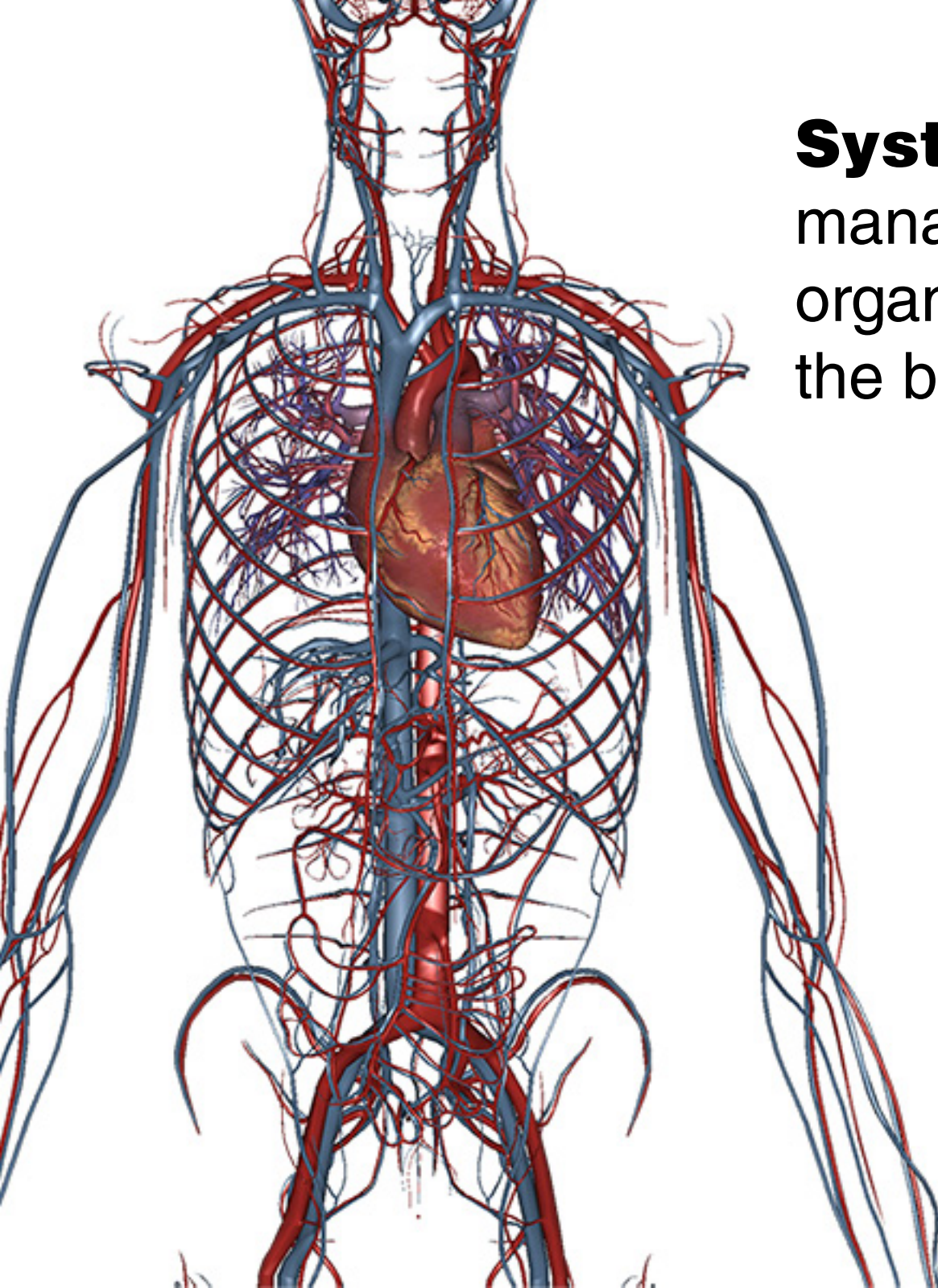
- **Pulmonary arteries** move **deoxygenated blood** from the right ventricle to the lungs.
- **Pulmonary veins** move **oxygenated blood** to the **left atrium** for distribution.



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Systematic vasculature manages blood flow to other organs and tissues throughout the body.

Factoid: Every human body has enough vasculature to wrap around the Earth 2.4 times.

Want to learn more about the heart?



Click the image to **watch** a demo on cardiac output.

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