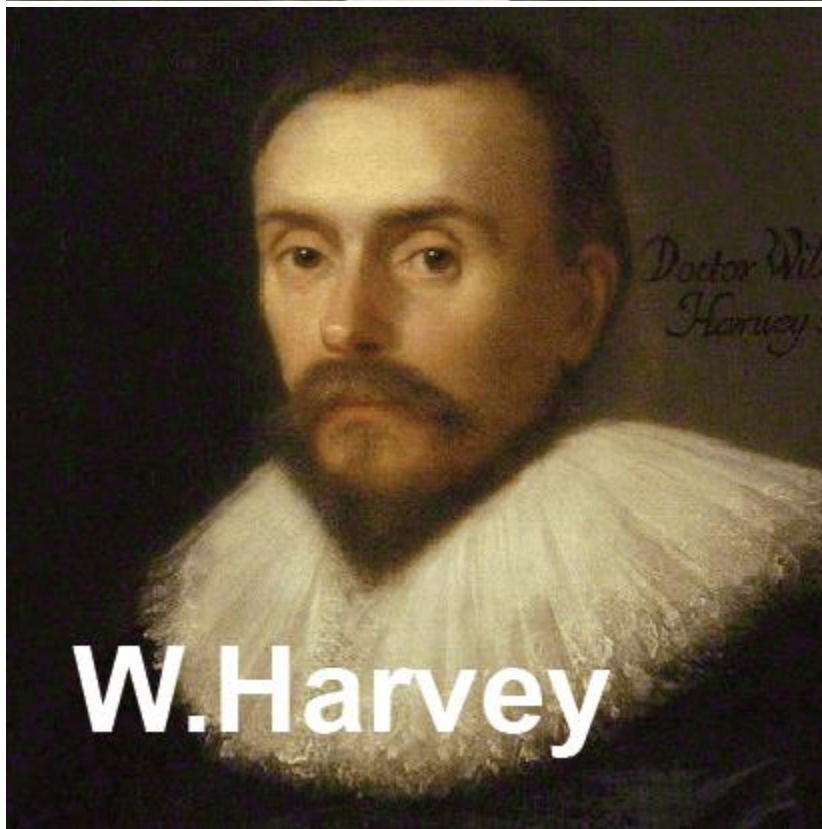
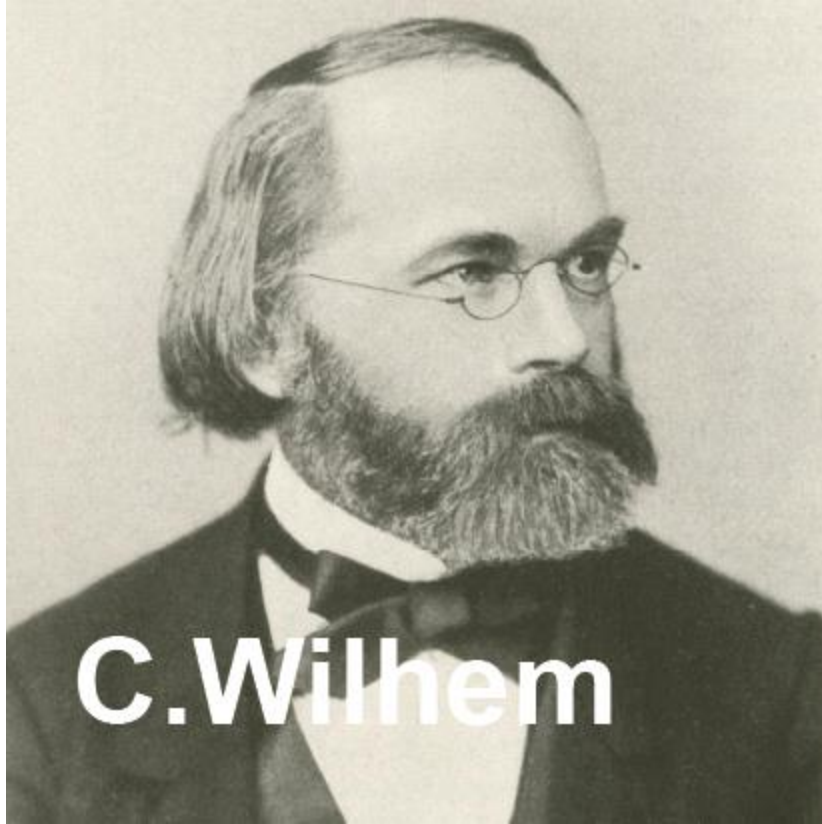


The science of human anatomy & physiology has always been a major science of interest to most people, including me. Those training to be involved in the medical field spend a tremendous amount of time studying in this field. Over the centuries we have studied the human body more than any other living creature, yet we still know very little of how it works. Even trying to keep it healthy is a major controversy. Look at the health food industry or spend a few hours studying different scientific reports on what are the best ways to keep it functioning to its best level and you will find many varying opinions.

But when we look at the Bible and see what God says about the human body, we find a solid foundation of information. The Bible does not mention all of the details of human anatomy & physiology, but what is mentioned is still true today.

Blood is Life

Until the early 1600s people did not understand that blood flowed through the body in passageways or tubes called vessels and carried with its nutrients and wastes. It would not be until the 1850s that a Swiss botanist named Carl Wilhelm von Nägeli discovered similar pathways in plants that he called xylem and phloem.



Carl Wilhelm by Ohne Angabe – Erziehungsrat des Kantons Zürich (Hg.), Die Universität Zürich und ihre Vorläufer, Verlag der Erziehungsdirektion Zürich, 1938, o.S., Public Domain, <https://commons.wikimedia.org/w/index.php?curid=65592380>

William Harvey attributed to Daniël Mijtens – National Portrait Gallery: NPG 5115, Public Domain, <https://commons.wikimedia.org/w/index.php?curid=5975113>

In 1628, William Harvey wrote *Anatomical Essay on the Motion of the Heart and Blood in Animals*. In this work he described systemic circulation through vessels to and from various organs of the body. He described the heart as a pump that kept venous blood separate from arterial blood. Though he had only a small magnifying glass to observe his test subjects, his inference was eventually proved correct.

Prior to Harvey's work and even after it people knew about blood, but they did not understand how it worked or what its use was. Many thought that blood could damage the body or make it sick. Thus, medical science began "bleeding" patients who were ill. They would make cuts in the body and drain out blood or they might have used leeches to remove small amounts of blood from infected areas. The use of leeches to remove small amounts of infected blood is still used today in modern medicine with some success, but this is different from draining out large portions of a patient's blood.



Leech photographed by GlebK – Own work, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=13669380>

George Washington By Gilbert Stuart – <https://www.clarkart.edu/artpiece/detail/george-washington>, Public Domain, <https://commons.wikimedia.org/w/index.php?curid=591229>

How much was drained depended upon the illness. It is noted that in some cases a patient could have half of their blood drained out of their body to supposedly make them healthy. Modern medicine today scoffs at this foolish notion. Patients today often receive extra blood from traumas, accidents, and some illnesses. For instance, George Washington became ill with a sore throat on December 13th, 1799, after spending the day before riding around his farms marking trees to be felled. He had his doctors called and they eventually bleed off 3 quarts of his blood. He died the next evening. Most doctors today exclaim this was one of the worse procedures that should have been performed on him.

Harvey's work eventually opened the door for scientists to understand what blood was and how it worked, but it would not be until the 1900s that people really began to understand it. Today we know that blood not just a fluid, but a tissue made up of platelets and proteins that promote clotting, red blood cells that carry oxygen and carbon dioxide it contains an army of five types of disease fighting cells called white blood cells. But what does the ancient book called the Bible say about blood?

Moses, who lived around 1450 B.C., was instructed by God to write in the Book of Leviticus about blood.

For the life of the flesh is in the blood...

Leviticus 17:11 (ESV)

Medical science today now realizes the Bible was correct, that blood is indeed life. In fact, the Red Cross uses a slogan that reads, "Give life, give blood." Sounds a lot like what Moses wrote 3,450 years ago.



Photo by Grant Whitty on Unsplash

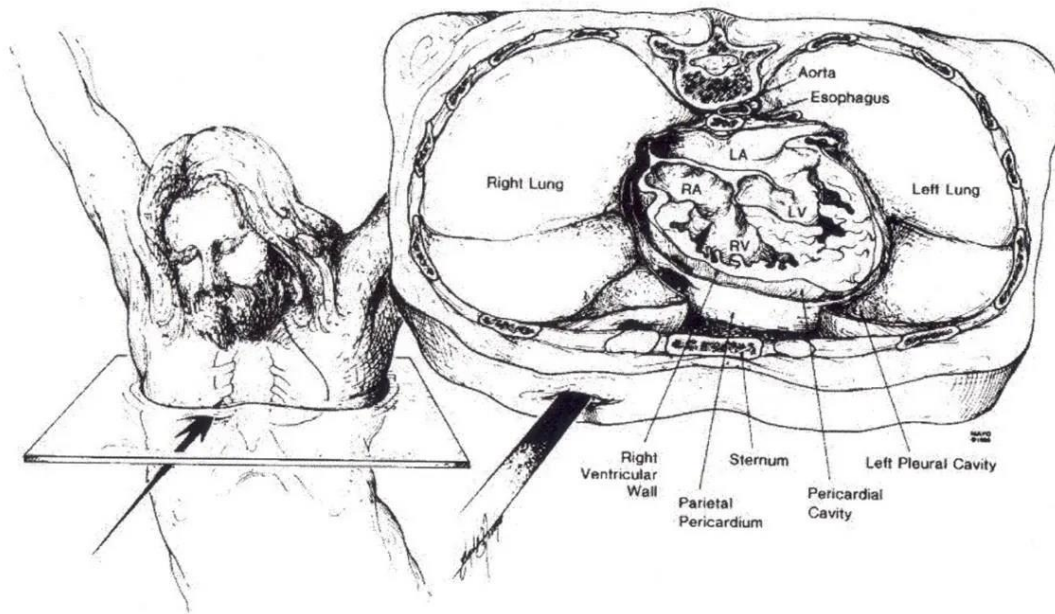
Anatomy of Crucifixion

In my opinion, one of the most fascinating scientific facts in the Bible is found in the account of the crucifixion of Jesus Christ. John, who was an eyewitness, wrote something that has been misinterpreted for ages, but is extremely accurate physiologically.

But when they came to Jesus and saw that he was already dead, they did not break his legs. But one of the soldiers pierced his side with a spear, and at once there came out blood and water. He who saw it has borne witness— his testimony is true, and he knows that he is telling the truth— that you also may believe.

John 19:33-35 (ESV)

Jesus was already dead, but the Romans had to be sure. They routinely would stab a victim in the heart (the vital organ) to make sure the victim was indeed dead. A trained soldier would have thrust a spear or sword under or through the rib cage to pierce the heart. To see blood flow from such a wound is obvious, as the liver and a lung would be pierced. Besides these two organs, a ventricle of the heart was their target. This stabbing is a fatal wound in itself.



Cross Section of the chest where Jesus was likely stabbed

When this happens, John mentions that blood and water flowed. Why the water? I have heard all sorts of wrong explanations from preachers and laymen who attempt to explain this. My favorite has to be when a preacher told his congregation that the water was actually urine, because the soldier would have stabbed Jesus in the bladder to make sure he was dead. Really? I mean what Roman soldier was trained to kill someone by going for the bladder? This is ridiculous at best.

What is being described here in John's gospel is scientifically accurate. Let me explain the anatomy of a human heart. The heart sits in a chamber in the chest called the pericardial cavity. Since the heart beats the entire life of a person, it would cause friction from its movement and the surrounding organs. Normally, this friction would cause severe pain in the chest of a living person. God thus designed a membrane called the pericardium to surround the heart.

This pericardium produces a transudate or liquid lubricant that counteracts the friction, significantly reducing it. This pericardial fluid is clear and resembles water. When Jesus was stabbed by the Roman to determine if he were dead, the puncture would of course produce a flow of blood. But in reaching the heart cavity, the blood would be followed by pericardial fluid, which to the fisherman John's eyes, appeared to be water. So, what John

witnessed was the blood and pericardial fluid pouring out of the chest of Jesus, indicating his death.



Hematidrosis Photograph by Saugato Biswas, Trupti Surana, Abhishek De, Falguni Nag – CC licence, the image hematidrosis case report, CC BY-SA 3.0, <https://commons.wikimedia.org/w/index.php?curid=33584837>

Hematidrosis in the Garden of Gethsemane (before the crucifixion of Jesus)

One amazing case recorded in Luke's gospel regards a rare medical condition called hematidrosis. Hematidrosis, is a condition in which capillary blood vessels that feed the sweat glands in the skin rupture, causing them to exude blood. This rare infirmity occurs under conditions of extreme physical or emotional stress.

Leonardo Da Vinci wrote about a soldier who, under great stress before a battle, sweated blood. It has also been observed by modern medical staff who have treated patients under tremendous stress. Some cases involved being aboard a sinking ship in a storm, awaiting execution, fear of a sexual assault, and it was observed during the blitz in London during WWII.

Hematidrosis is caused by capillaries that surround the sweat glands found in the skin rupture and spill their blood into the gland whereby it mixes with sweat and is delivered to the surface of the skin. Other cases involved the skin becoming so fragile that it cracks and ruptured blood vessels deposit blood on the surface of the skin. In both cases, the skin becomes very fragile and is prone to breaking. And being sweat helps cool the body, retaining body temperature is compromised when hematidrosis occurs.

The Bible actually is one of the only ancient documents that record this rare condition. It is recorded by a physician, Dr. Luke.

And being in agony he prayed more earnestly; and his sweat became like great drops of blood falling down to the ground.

Luke 22:44 (ESV)

Jesus at this time was in the Garden of Gethsemane and was beginning to experience the shame and despair of all people's sin upon Himself. This had to be emotionally crushing, the condition for this rare disorder. Being human from His mother Mary, he experienced our pain and anguish over sin. Now compound that with all the people who ever lived and that is a crushing load to bear. His skin is not primed for hematidrosis and Luke, a physician, authored this medical event.

Though some call this a miracle, it is a known medical condition and Jesus is experiencing the circumstances that make this disorder occur. It is not a miracle, but the physical result of enduring our sins that brought on the disorder.

We have examined a few of the human anatomy details found in the Bible. There is not many, but this is not surprising since the Bible is not a science textbook. But as we have seen, what human biology details are included in it, they are accurate!