

2019 PSBR High School Essay Contest
Finalist

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Only about nine hundred sixty children born in the United States are diagnosed with hypoplastic left heart syndrome each year, and my cousin was one of them in the year 1999. Hypoplastic left heart syndrome is a condition where only half of the heart is formed during pregnancy. This then affects blood flow throughout the heart. As a result, it is difficult for the oxygenated blood to travel throughout the body. Hours after her birth, my cousin had to undergo multiple surgeries to help raise her survival rate as much as possible. Infants born with this condition only have about a 42% chance of survival. My cousin was stuck in the hospital for months, not truly being able to breathe on her own. Fortunately, the surgeries went well and she was able to live through infancy. Her childhood was spent going back and forth to the hospital, and it became her normal way of life. At the age of fifteen, she had to receive another surgery to get a pacemaker put in place. A pacemaker is a device meant to help control the rhythms of a heart. It helps to control blood flow and helps to maintain a steady heartbeat. Now nineteen years old, hypoplastic left heart syndrome still affects my cousin's life every day. She takes various pills multiple times a day and still occasionally has to go to the hospital to make sure no problems have arose. She has never been able to participate in gym and cannot go through security without having to be patted down. As a result of her condition, she has suffered through depression and bullying from other kids at school. Having hypoplastic left heart syndrome has been a challenge for her, but thanks to modern medicine, she is able to thrive as an adult.

Animal research plays a role in developing many different types of medical devices, including the pacemaker. John Hopps, the inventor of the pacemaker, began his research through exploration with starting hearts, and the first heart he started was that of a dog. He then kept experimenting with dog hearts to develop the first pacemaker. However, it took another engineer name Rune Elmqvist to create a pacemaker that was small enough to be placed inside a human body. Without being able to experiment with dogs, Hopps may have never been able to create a pacemaker that would work well enough to keep an actual human alive. Now, they work very well in most people. Even dogs, cats, and horses are able to have pacemakers planted in their bodies. Pacemakers have replaceable batteries and wires to help the pacemaker function. In the future, medical researchers hope to develop wire free pill-sized pacemakers. They are also hoping to get to the point where pacemakers will not even be needed but that stem cells can be inserted into the heart to help it fix itself. Animal research is playing a large role in the future developments researchers are hoping to implement. Zebrafish and mice both have circulatory systems and cell systems similar to a human and are therefore, essential to the research process. The zebrafish is translucent, and the heart can easily be

studied through the skin. The zebrafish is also able to regrow part of their heart that has been removed. Scientists are studying zebrafish to gain insight on how they are able to do this. The way people are able to live with heart disease will be able to improve significantly with the expansion of stem cell research. Stem cells have been used to help with many illnesses, and soon it will include many different types of heart disease. As a result of the advancements in medical research, people like my cousin are able to live longer and to live healthier lives.

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