

A Course That Illuminated My Course (of Life)
By Leyana Thaha

I selected medicine as my main focus of study in this course because of my immense passion for helping others and my dream of becoming a doctor. Throughout my childhood, I was constantly posed with questions concerning my future and potential career paths. Unlike many others, I always found it easy to answer these questions as my dream of being an ophthalmologist has remained the same since I was very young. At three years old, I was diagnosed with a rare eye condition; one of my eyes had a prescription of negative twenty-three while the other was considered “beyond perfect”. After frequent eye checkups over the years, I became fascinated with my vision and the way it slowly evolved over time. As I approach eleventh grade, I am grateful to have been exposed to various fields of medicine. I chose this course because I hoped to expand my knowledge of the medical field and its diverse specialties. During my lessons, I was utterly amazed by the intricacies of the human body, from the most basic cells to their overall function. This experience has enlightened me to various aspects of medicine, opening more potential areas of study in the future.

The lesson I found most intriguing was the story of the railroad worker Phineas Gage whose nature was drastically altered as a result of his brain injury. His experience stressed the critical role of our brains in maintaining our well-being and the various mental changes it is capable of undergoing. His story helped me understand the function of each lobe of the brain; especially the frontal lobe which controls our personality. Neurology showed me that akin to the stem of a plant, our brains cannot function optimally without support from the brain stem. This is an integral part of the brain that controls everything we do not consciously think about; this involves breathing, heart rate, blood pressure, and more. I do not think our brains receive enough credit for the multitude of incredible tasks they perform; the neurons in our body are in constant communication to transmit messages to ensure we operate properly and safely.

I enjoyed learning about the digestive system as it shed light on issues I have encountered in my everyday life and the reasoning behind them. Take for instance being lactose intolerant, a condition I know many people have. Before this course, I had never thought about the “why” and “how” behind it. I learned that if the body does not make enough lactase enzymes then the sugar lactose that is found in dairy products will not be digested in the small intestine and because of osmosis it will remain in the gut; thus bacteria will feed on it, leading one to feel gassy and uncomfortable. Learning the science behind this common issue has made me more empathetic to lactose-intolerant people. Additionally, I enjoyed the analogy of our stomachs to laundry machines, constantly churning and when empty letting our grumbling noises or “borborygmi” send a signal that we need more food to absorb. This new term has made it into my everyday vocabulary and I am more aware of responding to my own “borborygmi.” Another

statement I never thought I would utter is that humans are walking donuts. Similar to a donut having a hole, the alimentary canal in our digestive system, the tube that runs from the mouth to the anus acts as a hole for humans.

Cancer is a riveting but also frightening concept to explore because of how intelligent and adaptable it is. A mutation is not the only way for cancer to spread as DNA methylation presents another easy path for cancer to take over our bodies. For example, if DNA methylation persists on tumor suppressor genes it will remove the brakes on the cell cycle resulting in uncontrolled cell division. Contrarily, when it is on the proto-oncogenes, the accelerator of the cell cycle will be activated when it is not supposed to be and will lead to the same outcome. Fortunately, our bodies have natural defense mechanisms, such as the immune system, that can detect cancerous cells because of antigens and will kill them off. Another incredible aspect of cell division is the role of telomeres, found at the tip of DNA strands which shortens each time a cell divides. The length of the telomere determines the lifespan of a cell. Researchers are exploring ways to extend the telomeres to try and prevent aging and death. Cancer cells are ahead of the game and are already doing this by making telomerase which is responsible for making telomeres, so the cell can not die and continue to spread. Although cancer has many tricks up its sleeves I believe that we are on the right path to figuring out ways to effectively combat it. Additionally, epigenetics came up in the lesson with the story of the Dutch Hunger Winter. This has allowed me to link any diseases I may develop in the future as a result of my parent's lifestyles. For instance, poor lifestyle choices such as smoking can alter DNA methylation patterns silencing specific genes that are necessary to maintain good health; this consequently increases my genetic susceptibility to more diseases.

One of my favourite activities was working on differential diagnoses for various patients. I particularly enjoyed researching the case of a 72-year-old man who returned home to the UK from Australia and had sudden chest pains, shortness of breath, and a swollen right leg. His condition stood out to me because of the multiple diagnoses that seemed plausible, including a pulmonary embolism or a clogged artery. Ultimately he was revealed to have a blood clot in his leg which was also one of my initial considerations. However, my research gave me insight into other medical conditions and their symptoms and impacts. During my cardiology lesson, I was surprised to learn that the "still" guards outside Buckingham Palace do move to ensure blood flow throughout their body and they do not get blood clots; I will be sure to look out for that the next time I visit Buckingham Palace. Furthermore, I was shocked to learn that coronary heart disease, caused by the accumulation of fatty substances in the coronary arteries, is the leading cause of death in the world. What truly blew my mind was one of the treatment methods, coronary artery bypass graft. In this procedure the heart is temporarily stopped using a drug and a lung bypass machine circulates oxygenated blood throughout your body. This allows a surgeon to connect a blood vessel from another part of the body to the blocked coronary artery so it can

bypass the clogging. The stopping of their heart means they are technically dead for this surgery before they are revived which is truly astounding.

I was thrilled when we turned to our ophthalmology lesson and I learned about a great variety of eye conditions. One topic that caught my attention was cataract surgery, a common procedure for people when they get older. It was fascinating because it was a relatively quick and straightforward surgery. The process takes five minutes and involves cracking the lens in the eye and replacing it with an artificial one. Moreover, someone who develops a cataract in one eye has a high chance of it happening with the other eye as well. This means that there will be a high demand for these surgeries; in other words, this implies the potential for a very successful career. I found it intriguing to discover that our cornea, the front of our eye, has more pain receptors than anywhere else in the human body. This explains why it is so sensitive; I wear contacts and I have noticed that even though my fingers are clean, minor oils or substances can lead to significant discomfort in my eye. One of the biggest takeaways was how insightful simply examining the eye can inform you about someone's health. For instance, a copper ring around the iris can let doctors know that a person has Wilson's disease, the buildup of copper in their organs. Getting a glimpse into an ophthalmologist's life has deepened my interest in pursuing a career in the field.

Apart from the actual medical science, I am interested in revisiting the topic of medical ethics. Adhering to the principles of beneficence, non-maleficence, autonomy, and justice not only shapes exceptional doctors but also helps keep strong relationships between doctors and patients, where patients feel respected, safe, and comfortable. It was heartbreaking to hear the racist story of the Tuskegee Syphilis Study and how African American men were infected with syphilis without their consent and given no treatment. These men were forced to suffer through an unwanted disease; as a result, this formed a distrust between doctors and African Americans. Despite the tragedy, this study paved the way for the implementation of ethics approval processes to prevent any more heinous medical experiments. I aspire to apply these medical ethics in my journey to becoming a doctor. I hope to use them to guide my decisions, provide the best patient care, and overall be a compassionate, successful doctor.

Throughout this course, I have come across a lot of important information that helped me gain insight into why our bodies function the way they do. Due to the numerous fields we touched upon, I have become invested in many different aspects of medicine. While my dream career is still an ophthalmologist, I believe it is best to take things one step at a time and keep my options open for the future. Dr. Elizabeth Le gave me wise advice to not rush my career decision as I am still learning about my interests and have a lot of time. I hope to study deeper into the medical specialties I have been exposed to in this course. Once I have had the opportunity to become more knowledgeable and gain additional experience, I will be in a better position to make an informed decision about what type of medical field I want to specialize in.