Archimedes of Syracuse, an ancient Greek mathematician, engineer, and inventor once said, "Give me a lever long enough and a place to stand, and I will move the world." In my eyes, no lever is complete without the person pulling it. We cannot conduct research without considering thoughts of the patients involved, reducing patients to bundles of symptoms, if we hope to achieve the pinnacle of treatment. Plus, with knowledge of the furthest edges of our fields' capabilities we can truly hope to provide the best possible care to our patients. I see the MD and PhD degrees as not only mutually beneficial, but both essential to my future goal of becoming a physician and a scientist.

Since starting college, I knew I wanted my research to focus on electrical medicines such as neural interface technologies and biomechatronics. For this reason, I minored in Electrical Engineering and read the research of Dr. Dustin J. Tyler and Dr. Hugh Herr, among others. Many treatments miss important parts of the problems they were designed to address and may be underused or discarded. According to one of Dr. Herr's papers, for a significant length of time, prosthetic design and research had focused on mundane parts of everyday life and little attention had been paid to unique options like dancing. Dr. Tyler cites that one of the things one of his patients wanted most was the ability to feel but only recently have such technologies been developed. Many lab-made solutions are difficult for patients to use or lack sufficient utility. I believe my engineering and game design skills will prove invaluable in making treatments more accessible for patients.

I have already started to work these principles into the work I have done; in fact, I have already worked on a project to help amputees. I developed a game for amputees to train on how to use their prostheses for my senior project. I led my team to simplify and make portable the current complex tool patients used, by using rhythm games. These types of games include repetitive motions while still retaining player engagement, both perfect for a training tool. By making each joint of the prosthesis relate to a different slider we made easy visualizing progress and practicing accuracy. Using control systems models, researchers and doctors can use recorded data to get a measure of a patient's improvement over time at home since the game requires minimal specialized equipment. The project also addressed colorblind individuals by using an accessible color palette with high contrast.

President John F. Kennedy is oft credited with the quote, "We choose to go to the Moon... not because [it is] easy ,but because [it is] hard." We treat patients because the problems at the core of patient health are hard and so we need a "lever strong enough" and "a place to stand" to help those people. For research, that lever is patient input and feedback, for medicine, that lever is research, but, for both, the place to stand is together.