

My Experience as a NIDRR Scholar

Quantitative and Subjective Analyses of Walking in an Individual with Bilateral Below-Knee Limb Loss

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Introduction

My name is Kellie Lim, and I am a junior majoring in Biological Sciences and Asian Studies at Northwestern University. I am interning at the Northwestern University Prosthetics Research Laboratory and Rehabilitation Research Engineering Program as a Scholar for the National Institute on Disability and Rehabilitation Research (NIDRR). My interest in this internship lies in the fact that I am a bilateral below-knee amputee and I have a desire to learn more about the field of prosthetics.

When I was eight years old, I contracted meningococemia, a bacterial form of meningitis. This disease attacks the circulatory system and blocks the blood from circulating throughout the body. As a result, I became a multiple amputee, losing portions of my legs below the knees, my right arm below the elbow, and several fingers of my left hand. It was difficult learning how to perform the basic tasks of everyday life, but since I was still young, I learned quickly and adapted to my environment.

Nine years later, I began my college career at Northwestern University. Like many undergraduate students, I had to think about which studies to pursue and which career to aim towards. Since I was already interested in the field of prosthetics, I sought an internship that dealt with research in that area and this led me to the NIDRR Scholars program at NURERC.

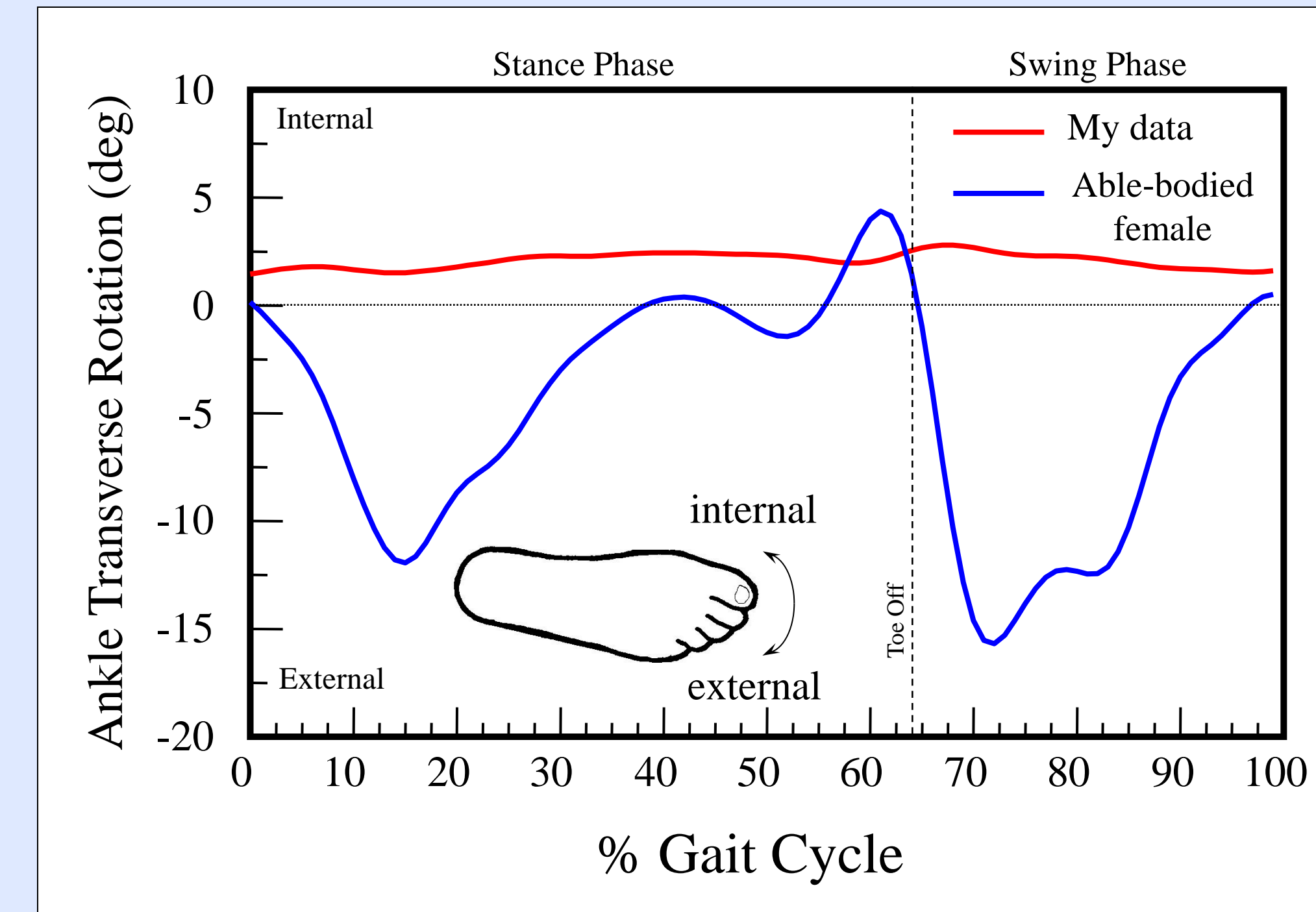
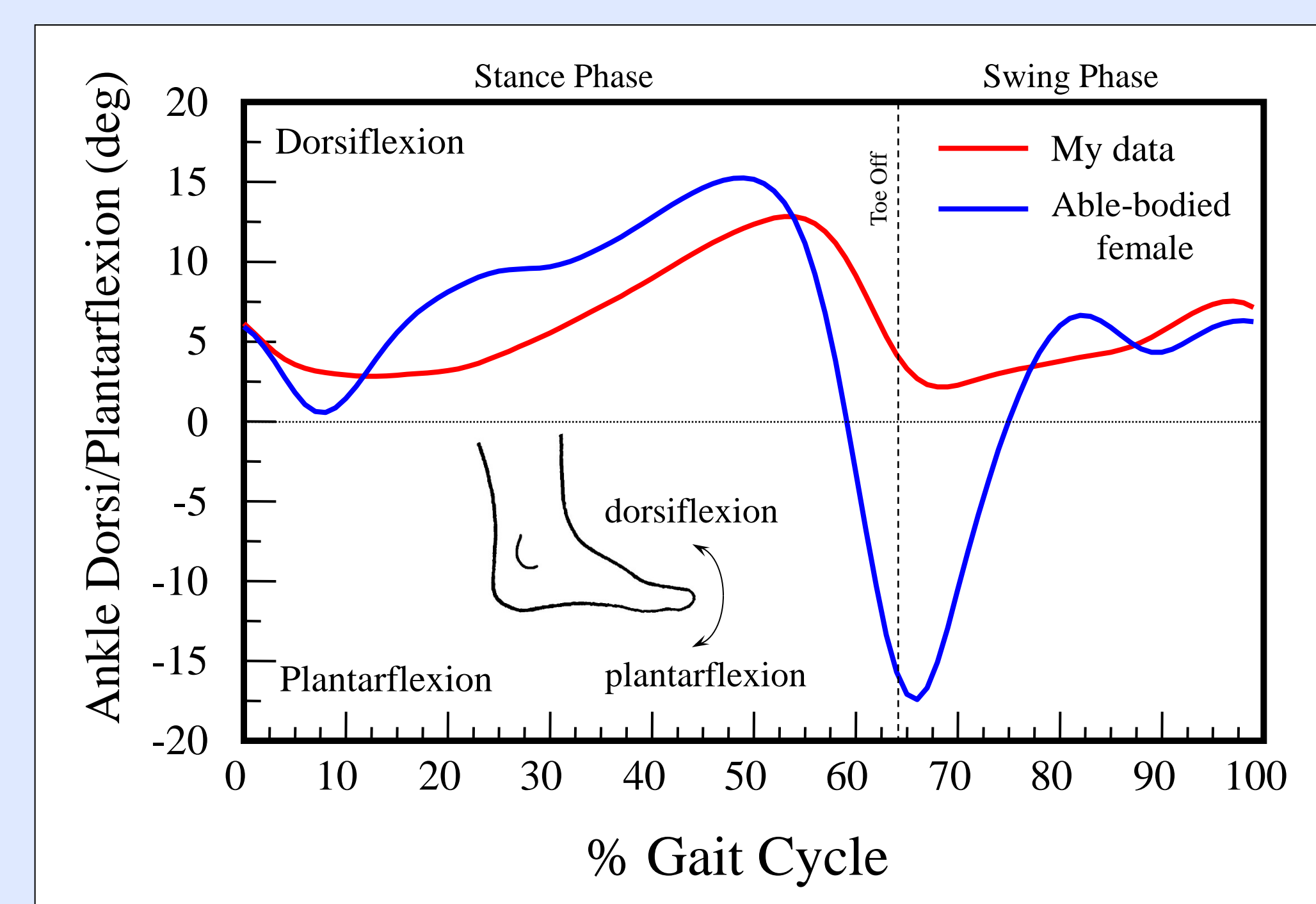
NIDRR Scholars Project

The NIDRR Scholars Program provides opportunities for disabled undergraduate students to research social and technical issues in a wide range of disabilities. Currently, there are fifteen centers across the nation that participate in this program, and each center focuses on different disabilities. Each NIDRR Scholar works with a mentor, a faculty member at the facility, on a research project that deals with some aspect of disability. My mentor is Steven A. Gard, Ph.D., and the topic of my research project was the gait analysis of a bilateral below-knee amputee, with myself as the primary subject.

The objectives of the study were to identify functional limitations of the prostheses and to identify compensatory actions employed by the bilateral below-knee amputee. Gathering and processing of data on my walking patterns were done at the VA Chicago Motion Analysis Research Laboratory. By comparing my data to those of an able-bodied female, I learned about how I had adapted to walking with prosthetic limbs. Here are a few examples of the data I collected:

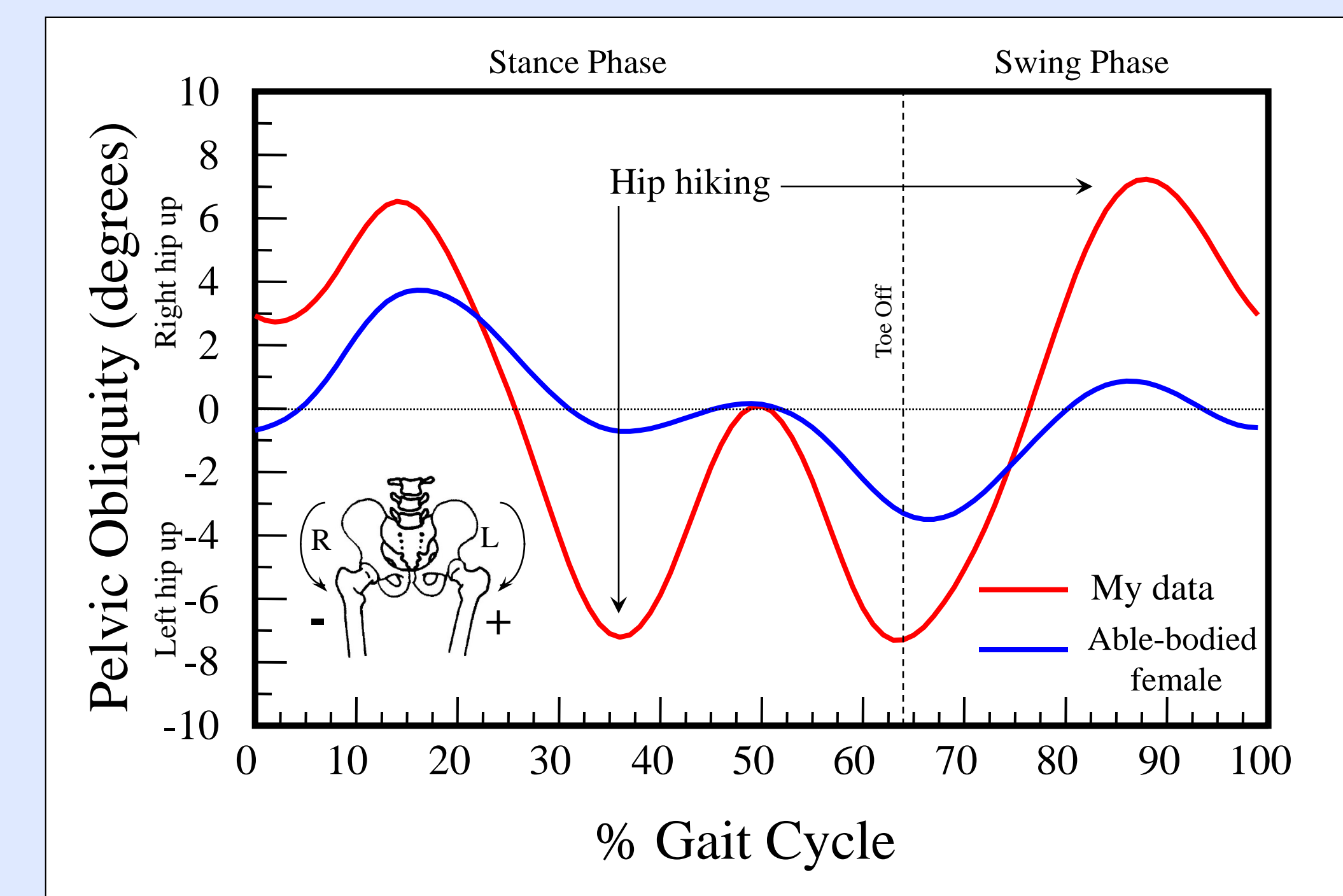
Ankle Dorsi/Plantarflexion

According to the data, the prosthetic foot does not plantarflex. This is due to prosthetic foot alignment, the lack of an ankle mechanism, and the passive nature of the foot. However, the foot acts as a spring and it dorsiflexes when load progresses onto the forefoot.



Pelvic Obliquity

Pelvic obliquity is measured from the position of one hip relative to the position of the other hip. In my gait data, hip hiking is observed. Hip hiking is a compensatory action that is used to gain foot clearance during prosthetic swing phase.



NIDRR Scholars Conference

In May 2000, NIDRR invited all the Scholars to attend a conference in Washington, D.C. in order to meet other Scholars and to exchange information about the individual projects. Every Scholar gave a presentation of their research, and some opted to provide a short biography as part of the presentation. The other research projects spanned a wide range of subjects. One project focused on the relationship between religiosity and disability, specifically how the onset of a disability affected and individual's religious behavior. Another Scholar became a mentor at a middle school and organized a program that gave students hands-on experience in rehabilitation engineering.



The duration of the conference was not entirely devoted to presentations. The group was able to tour the White House and the Capitol. I enjoyed the tours immensely since I personally saw these historical monuments, which was much more impressive than viewing them on television or through pictures.

I will continue to intern at NURERC for the summer. More in-depth analysis will be performed on the data collected from the research project on bilateral below-knee gait.

Acknowledgements:

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