Walk a Mile in a Transtibial Amputee's Shoes  
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Research Question: Can we fabricate a prosthosis like device that a non-amputee can wear that will more realistically replicate the sensations that a lower-limb transtibial amputee would have while ambulating/wearing a typical prosthesis?

This project involved the fabrication of a unilateral transtibial prosthosis with a silicone inner liner that can be worn by a non-amputee. A problem we have found is that students and practitioners alike do not have a truly realistic way to relate to the pressures and sensations patients experience when wearing and ambulating in transtibial prostheses. A new device is needed to be able to understand and feel what it is like to weight-bear and ambulate on the type of device that we will be putting on patients. The current devices on the market, which allow one to experience what it is like to walk with prostheses, do not give a realistic simulation of what an amputee actually feels; the forces are not distributed as they would be in an actual socket.

We do not believe that our device will replicate all of the experiences that an transtibial amputee has, although we hope that our device can provide an educational experience that will allow prosthetic students and practitioners to be able to get a little bit closer to understanding out patientâ€™s experience. Our device gives a more accurate simulation regarding what transtibial prostheses feels like during ambulation. We have created a device that has been closely fitted to one of the researches, as well as a device that can be worn by multiple individuals. Our device is a transtibial socket without a distal end. It has metal sidebars that attach to a prosthetic foot. The true foot dangles so all of the weight is distributed through the socket in order to achieve a more realistic simulation. In order to accommodate the height discrepancy, a shoe lift is used on the opposing side with a unique design to allow for normal gait. The socket is also donned by sliding the foot through, just as an amputee dons their prosthesis.

The device fabricated for multiple wearers has a bi-valve PTB weight bearing exoskeleton, similar to a PTB unload brace. The design has an anterior and posterior overlapping shell, and is lined with Aliplast. The bi-valve is secured with Dacron and Velcro straps. A foam universal shoe lift will be provided to allow people to be able to try on and walk around in the most realistic approximation of what it feels like to wear a transtibial prosthesis.