Developing an Adjustable Transtibial Prosthetic to Accommodate for Pediatric Lower Limb Loss in Under Resourced Areas

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A Below Knee Amputation (BKA) or Transtibial Amputation is a life-saving procedure performed when the lower leg becomes severely diseased, damaged, or nonfunctional. Although BKA recipients generally have high success rates, access to appropriate care remains a challenge, specifically in under-resourced areas. A significant issue for transtibial amputees is the volume fluctuation in the residual limb due to fluid retention changes, which can greatly affect prosthetic fit and function. This problem is even more pronounced in pediatric patients who experience rapid limb growth and require frequent prosthetic replacements. Unfortunately, the high cost and complexity of traditional prosthetic development make these issues even more difficult to combat. By utilizing advanced 3D printing technology, this project aims to address these issues by developing a prosthetic that accommodates volume fluctuations while prioritizing affordability, durability, and modularity. The resulting device has the potential to improve accessibility, and quality of care for transtibial amputees worldwide.

Awards Won: