Evaluation of Alignment Methods for Transtibial Prostheses
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Abstract

Introduction- There are an estimated 3-4 million amputees in need of a prosthesis in developing countries. These people are unlikely to receive prosthetic limbs due to remote living conditions, finances, and few providers of care. The monolimb* is considered appropriate prosthetic technology for developing countries. The monolimb is made of fewer components, more affordable, durable, and appropriate for prosthetic outreach missions because it can be delivered on an initial fit. Appropriate alignment of the monolimb must be captured prior to fabrication because the prosthesis is not modular. Objective- To determine if an alignment method based on patient measurements produces a more appropriately aligned prosthesis than traditional bench alignment (TRAD). The alternative alignment methods included the vertical alignment axis (VAA) and anatomical based alignment (ABA). Methods- 8 transtibial amputees, 8 students of prosthetics, and 2 prosthetists per amputee-student pair participated in the study. The student bench aligned 3 sets of endo components for the amputee according to each alignment method. The prosthetists dynamically aligned the 3 prostheses for each amputee. The magnitude of change from bench to dynamic alignment was determined by quantifying 6 alignment parameters. Results- No significant differences were found between the 3 different alignment methods. Future Directions- Control the student variable to test the accuracy of the alignment methods. Control the amputee variable to test how little training is necessary to appropriately align a prosthesis with the 3 alignment methods.

References


*To learn more about monolimb prostheses that have been fit to landmine victims at the Thai-Burma border, please visit the Clear Path International website, http://www.cpi.org.