

Abstract

Author: Jiří Bešťák

Title: The effect of footwear on walking and running of patients with an amputation

Objective: The main objective of this bachelor thesis is to assess the effect of footwear on prosthetic gait and provide an overview of this theme. The thesis is focused on anterior-posterior ground reaction force and its changes with variations in footwear.

Methods: Four probands (one woman, three men) with transtibial and transfemoral amputation participated in the study. Their age was 20 to 60 years during the study. A condition for inclusion in the study was people with transtibial/transfemoral amputation, degree of activity greater than two, absence of subjective symptoms, traumatic injury. The study was conducted in the extreme load laboratory at FTVS UK. Kinematic data from the Kistler force plates were measured. The obtained data were exported from Qualisys Track Manager software through a text document into MS Excel. The data were appropriately adjusted for subsequent processing and evaluation in MATLAB. The resulting data were compared individually.

Results: The results demonstrated that flat shoes did not affect anterior-posterior ground reaction force. Barefoot gait also did not affect anterior-posterior ground reaction force. Gait on hiking shoes affected anterior-posterior ground reaction force. In all cases, measurements would have to be carried out with more probands to confirm or refute the claim. The results of the bachelor thesis, together with the results of other authors, showed that there is a significant influence of the type of footwear on the walking of patients with an amputation.

Keywords: prosthetic gait, effect of footwear, anterior-posterior ground reaction force, kinematics of walking