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Orthosis and Finite Elements: A Study for Development of New Designs through Additive Manufacturing

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Abstract : The gait pattern in people that present motor limitations foment the demand for auxiliary locomotion devices. These artifacts for movement assistance vary according to its shape, size and functional features, following the clinical applications desired. Among the ortheses of lower limbs, the ankle-foot orthesis aims to improve the ability to walk in people with different neuromuscular limitations, although they do not always answer patients' expectations for their aesthetic and functional characteristics. The purpose of this study is to explore the possibility of using new design in additive manufacturer to reproduce the shape and functional features of a ankle-foot orthesis in an efficient and modern way. Therefore, this work presents a study about the performance of the mechanical forces through the analysis of finite elements in an ankle-foot orthesis. It will be demonstrated a study of distribution of the stress on the orthopedic device in orthostatism and during the movement in the course of patient's walk.

Keywords : additive manufacture, new designs, orthoses, finite elements
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