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GAIT ANALYSIS OF HUMAN AMPUTEES IN USE OF PASSIVE PROTHESIS

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Introduction: The human gait is the mechanism that promotes dislocation between two points of the body safely and efficiently, with low energy expenditure. Its analysis is consisted of two phases: support and swing. Transfemoral amputation leads to loss of proprioceptive information necessary for the gait, generating asymmetry in the cycle causing increased energy expenditure, along with lost of comfort and impact absorption, three very important elements of the support phase. **Objective:** To study the gait patterns of transfemoral amputees in use of passive prosthesis. **Methods:** This study was conducted among five subjects with transfemoral amputation aged 31.4 ± 6.22 weight 81.84kg ± 8.54 and height 1.79 ± 0.047 and one volunteer non- amputee, aged 29, weight 79kg and height 1.75m, all physically active. Initially the volunteers were submitted to a functional evaluation using a goniometer for analyzing the bilateral range of motion and bilateral muscular strength evaluation of the hip joint, according to Kendall (1955). Kinetic and kinematic data collection of the volunteers were performed with the system and software Qualisys Track Manager consisted by eight cameras and two force platforms, in which the subjects walked three meters five times. All movements were captured by infrared cameras using kinematic markers, distributed throughout the patient's body, following anatomical landmarks established by Helen Hayes (Kadaba, 1990). From the trajectories of the markers, inverse kinematics was used to calculate the angularly positions of each joint relative to the global coordinate system defined for the space experiment analysis of gait. We calculated the mean value of five tests from each patient and represented as a function of gait cycle. **Results:** The gait pattern was similar for the hip, knee and ankle of amputee volunteers in comparison to control. A prolonged charge transfer during the double support and balance especially of the non amputated was observed. Our results suggest

that deficits of the prosthetic leg like missing active knee extension and ankle push-off are compensated by the non amputee leg. **Conclusion:** Thus it is interesting to invest in the construction and using of an active prosthesis, so these compensations can be minimized.