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EFFECT OF NORMAL GAIT ON *IN VIVO* TIBIOFEMORAL CARTILAGE STRAINS

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Abstract

Altered cartilage loading is believed to be associated with osteoarthritis development. However, there are limited data regarding the influence of normal gait, an essential daily loading activity, on cartilage strains. In this study, 8 healthy subjects with no history of knee surgery or injury underwent magnetic resonance imaging of a single knee prior to and following a 20-minute walking activity at approximately 1.1 m/s. Bone and cartilage surfaces were segmented from these images and compiled into 3-dimensional models of the tibia, femur, and associated cartilage. Thickness changes were measured across a grid of evenly spaced points spanning the models of the articular surfaces. Averaged compartmental strains and local strains were then calculated. Overall compartmental strains after the walking activity were found to be significantly different from zero in all four tibiofemoral compartments, with tibial cartilage strain