

Immediate Effects of a Prophylactic Knee Support on Frontal Plane Knee Mechanics during Walking

Rachel Koldenhoven, Philip Mathew, Anthony Humble-Guither, Ashley Luman, Jacque Jones, Michael R. Torry. Illinois State University, Normal, IL. (Sponsor: Steven McCaw, FACSM)

INTRODUCTION: Knee supports (rigid unloader braces and neoprene sleeves) are often employed to decrease adductor angle and/or adductor moment and thus medial knee joint loading in persons with medial knee osteoarthritis. It is compelling that these gait alterations would also be considered beneficial in healthy individuals from a prophylactic application. Yet, the comfort of rigid braces and neoprene sleeves in a younger active population may pose wear-compliance issues. Retail apparel with 'built-in knee support systems' are being advocated to increase compliance for such purposes.

PURPOSE: To determine if a [prophylactic] knee support garment alters frontal plane knee mechanics in healthy females during walking.

METHODS: Nine females (21 ± 4 yrs; 59.6 ± 3.7 Kg; 1.63 ± 0.8 m) performed five walking trials with and without the knee support garment. Subjects walked at self-selected speed, cadence and step length were controlled via step length 'marks' demarcated on a 10 m walkway between conditions. Lower limb knee kinematics and kinetics were obtained and the external knee adductor joint moment was calculated. Conditions between with garment and without garment were compared with paired t-tests.

RESULTS: The garment caused an average 5.7° increase in sagittal plane knee flexion angle ($p = .02$) and an average of 1.5° reduction in frontal plane knee adductor angle ($p = 0.04$) at the time of the peak adductor moment. The peak vertical ground reaction force which dominates the knee adductor moment increased 1.4% ($p = .11$) and the peak adductor moment decreased 6.0% ($p = .47$)

CONCLUSIONS: The garment influenced the sagittal and frontal knee kinematics but did not alter kinetics.