

**PATHOKINESIOLOGY LABORATORY
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ABSTRACTS FROM PUBLISHED MANUSCRIPTS (2004 – 2005)

The influence of walking speed and footwear on plantar pressures in older adults. Burnfield JM, Few CD, Mohamed OS, Perry J. Clin Biomech 2004;19:78-84.

OBJECTIVE: To identify the influence of walking velocity and footwear condition on plantar pressure variables in healthy older adults.

DESIGN: Single session data collection during varying speed and footwear conditions.

BACKGROUND: Elevated plantar pressures are concerning due to the risk of tissue injury, ulceration, and pain. In young adults, increases in plantar pressure have been documented with faster walking speeds and when walking barefoot compared to wearing shoes. These relationships have not been systematically explored in older adults.

METHODS: Key plantar pressure factors were recorded as subjects walked barefoot and in comfortable walking shoes across a 10 m walkway at three predetermined velocities (57, 80, 97 m/min). Separate 3x2 analyses of variance with repeated measures identified significant differences in pressure, force, and contact area in eight anatomically defined foot regions across walking speeds and between footwear conditions.

RESULTS: Faster walking resulted in higher pressures under all foot regions except for the arch and lateral metatarsal ($P \leq 0.001$), due primarily to greater forces under the heel, medial metatarsal and toes ($P \leq 0.001$). Compared to wearing shoes, barefoot heel pressure was elevated ($P \leq 0.001$) due to reduced heel contact area ($P < 0.001$); pressure under the central metatarsals was higher ($P \leq 0.001$) owing to greater central metatarsals force ($P < 0.001$).

CONCLUSIONS: Two conditions were associated with higher plantar pressures in the older adults studied: faster speeds and barefoot walking.

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