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**The effect of functional foot stability on running gait**John Tan<sup>1</sup> and Malia Ho<sup>2</sup><sup>1</sup>NIE-Nanyang Technological University, Singapore<sup>2</sup>Central Queensland University, Australia

It is believed that the flat and high arched feet are structurally mal-aligned and exhibit gait deviations compared to normal arched feet. These deviations are believed to be the precursors to running related foot injuries. However, current literature investigating the relation between foot structure and running gait pattern have been inconclusive. We hypothesized that good functional foot stability can reduce these gait deviations; thereby reduce the risk of running related foot injuries. The effect of foot structure and functional stability on running gait pattern of the foot has not been studied. Therefore, the aim of this study is to determine the effect of functional foot stability on running gait pattern. 69 subjects (age=30.67.29) who were asymptomatic had their foot structure and functional foot stability assessed. The foot structures were assessed with foot posture index scores and the foot stability with modified Romberg's test. Kinematic and kinetic running gait variables (such as rear foot eversion, mid foot dorsiflexion, maximum vertical ground reaction force and loading rate) were recorded while subjects ran barefooted on an instrumented treadmill. The results showed that foot with higher foot posture index scores (more flat-footed) ran with greater rear foot eversion, mid foot dorsiflexion and weight acceptance rate whereas, foot with better foot stability ran with lower rear foot eversion.

**Recent Publications**

1. Ho M and Tan J (2015) The effect of taping on foot structure, functional foot stability and running gait patterns of the foot. *Journal of Sports Science*; <http://www.davidpublishing.com>, 3: 1-12.
2. Kim W, Joao F, Tan J, Mota P, Vleck V, Aguiar L and Veloso A (2013) The natural shock absorption of the leg spring. *Journal of Biomechanics*; 46(1): 129-136.
3. Wangdo Kim, John Tan, Antonio Veloso, Veronica Vleck, Arkady S Voloshin (2011) The natural frequency of the foot-surface cushion during the stance phase of running. *Journal of Biomechanics*; 44(4): 774-779.

**Biography**

John Tan is currently a Senior Lecturer in Physical Education and Sports Science, National Institute of Education (NIE) an institution of Nanyang Technological University (NTU) of Singapore. He has a Doctoral degree in Sports Biomechanics from Loughborough University. His areas of research are in kinematic video analysis, jumps golf swing; movement and gait analysis. He is currently a Member of Singapore armed forces' fitness advisory board and an Associate Lecturer with SUSS. He has also been invited by the Philippine association for sport and exercise sciences as an Invited Speaker to their annual conference in 2013, 2014 and 2016 to Lecture in various topics on PE and sports biomechanics.

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