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Measurements of knee rotation in vivo – Development and evaluation of an external device

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Abstract

The overall aim of this work was to evaluate a newly developed measurement device, the Rottometer, for measuring knee rotation in different flexion angles with different applied torques, in order to establish the normal range of healthy knee reference values and to study possible differences due to age and gender. The validity of the Rottometer was evaluated by simultaneous registrations with Roentgen Stereometric Analysis (RSA). The two methods showed high correlations concerning the total knee rotation at 90 and 60 degrees of knee flexion angles with 3, 6 and 9 Nm applied torques. The Rottometer was also concluded to be a reliable measurement device concerning the one-week-apart and within day intra-tester as well as the inter-tester reliability at 90, 60 and 30 degrees with 6 and 9 Nm as well as the examiner's apprehension of end-feel. In total, 120 knee healthy subjects (60 females and 60 males) equally distributed in four different age groups (15-30, 31-45, 46-60 and $\geq$ 60 years) were examined at 90, 60 and 30 degrees of knee flexion angles with 6 and 9 Nm applied torques as well as the examiner's apprehension of end-feel. No differences were found concerning different flexion angles, between the left and right knee or between the different age groups within the genders. However, the females showed a 10-20 % significantly larger range of knee rotation than the males at all different flexion angles and applied torques.

Biography

Per Otto Almquist graduated as RPT in 1991, and completed his PhD in 2012, at Lund University, Sweden. He works clinically as RPT at a health care clinic, and part time as teacher in biomechanics, anatomy, physical training and rehabilitation techniques at Lund University and Halmstad University, Sweden. He worked for several years as RPT for the Swedish and Norwegian National Ski teams, the Swedish National Artistic Gymnastic team and the Swedish National Wrestling team. He was selected for both the Swedish and Norwegian Olympic medical team during the Olympic Games in Nagano 1998, and in Salt Lake City 2002.

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