

# RELIABILITY OF A MOVEMENT QUALITY ASSESSMENT TOOL TO GUIDE EXERCISE PRESCRIPTION (MOVEMENTSCREEN)

Hunter Bennett, MExSc<sup>1</sup>

Kade Davison, PhD<sup>1</sup>

John Arnold, PhD<sup>1</sup>

Max Martin, BExSc<sup>1</sup>

Scott Wood, BExSc<sup>1</sup>

Kevin Norton, PhD<sup>1</sup>

## ABSTRACT

**Background/Purpose:** Movement quality is commonly assessed to identify movement limitations and guide exercise prescription. Rapid growth in the movement assessment landscape has led to the development and utilization of various movement quality assessments, many without reliability estimates. MovementSCREEN is a novel, tablet-based, video-recorded movement assessment tool, currently without published reliability information. Therefore, the purpose of this study was to determine the intra and inter-rater reliability of the MovementSCREEN, including the impact of rater experience, and provide estimates of measurement error and minimal detectable change.

**Study Design:** Cross-sectional design; reliability study.

**Methods:** Thirty healthy young adults (14M:16F, mean age 28.4 yrs, SD 9.1) were video recorded completing the nine MovementSCREEN assessment items on two occasions, two weeks apart. Each individual movement was assessed against objective scoring criteria (component items: yes/no) and using a 100-point sliding scale. To create an overall score for each movement, the scale score is weighted against the objective items to provide a score out of 100. At the completion of all nine individual movements, a mean composite score of movement quality is also established (0-100). The first recording was scored twice by two expert and two novice assessors to investigate inter- and intra-rater reliability. The second recording was scored by one expert assessor to investigate within-subject error. Inter- and intra-rater reliability was calculated using intraclass correlation coefficients (ICCs) and Kappa statistics. The standard error of measurement (SEM), and minimal detectable change (MDC<sub>95</sub>) for the overall score for each movement, and the composite score of movement quality, were calculated.

**Results:** Intra-rater reliability for the component items ranged from  $\kappa = 0.619 - 1.000$  (substantial to near perfect agreement) and  $0.233 - 1.000$  (slight to near perfect agreement) for expert and novice assessors, respectively. The ICCs for the overall movement quality scores for each individual movement ranged from  $0.707 - 0.952$  (fair to high) in expert and  $0.502 - 0.958$  (poor to high) in novice assessors. Inter-rater agreement for the component items between expert assessors ranged from  $\kappa = 0.242 - 1.000$  (slight to almost perfect agreement), while for novice assessors ranged from  $0.103 - 1.000$  (less than chance to almost perfect agreement). ICCs for the overall scores for each individual movement from expert and novice assessors ranged from  $0.294 - 0.851$  (poor to good) and  $0.249 - 0.775$  (poor to fair), respectively. The SEM for the composite score was 2 points, while the MDC<sub>95</sub> was 6 points, with an ICC 0.901.

**Conclusions:** The MovementSCREEN can assess movement quality with fair to high reliability on a test-retest basis when used by experienced assessors, although reliability scores decrease in novice assessors. Comparisons between assessors involve greater error. Therefore, the training of inexperienced assessors is recommended to improve reliability.

**Level of Evidence:** 2b

**Keywords:** functional movement screening, movement dysfunction, movement quality, movement system

<sup>1</sup> Alliance for Research in Exercise, Nutrition and Activity, Sansom Institute for Health Research, University of South Australia, Adelaide, Australia.

**Conflict of Interest:** Professor Kevin Norton and Max Martin are directors of Movement Screen Pty Ltd, the company that developed the MovementSCREEN movement assessment tool. Neither was involved in any part of the data management or analysis.

Mr Hunter Bennett, Mr Scott Wood, Dr Kade Davison, and Dr John Arnold declare no conflicts of interest.

## CORRESPONDING AUTHOR

Hunter Bennett

University of South Australia, GPO Box 2471, Adelaide, SA, 5001

E-mail: hunter.bennett@mymail.unisa.edu.au  
+61 433 377 222