

Methodological Considerations When Assessing Lower Extremity Function With A Single-Leg Hop For Distance Test

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Lower extremity function is often assessed using a single-leg hop for distance test. To assess lower extremity function clinicians often use the mean (MN) or maximum (MAX) score of a pre-determined number of repetitions. Our purpose was to determine if there were any differences in these methods of analysis. Twenty ACL reconstructed (ACLR) subjects (age= 25.8 +/-8.1 yrs, ht=175.8 +/-8.5 cm, and wt=73.3 +/-14.0 kg) and 20 age matched controls (age=24.5 +/-6.9 yrs, ht=175.8 +/-8.3 cm, wt=71.4 +/-12.1 kg) were randomly selected to participate in this study. The single-leg hop was performed three times with each extremity. The mean score in centimeters was calculated using all three scores. Two 1-between (Group) 1-within (Method) repeated measures ANOVAs were used to assess differences between Group (ACLR, Control) and Method (MN of 3 trials, MAX of 3 trials) for the involved and uninvolved extremity. There was a significant Group x Method interaction [F (1,38)=4.66, p=.037] for the involved but not the uninvolved extremity [F (1,38)=2.62, p=.114]. Tukey HSD post-hoc analysis revealed a significant difference between the MN and MAX for the ACLR group (MN=162.5 +/- 24.2cm, MAX=173.32 +/- 27.9cm) and the Control group (MN=180.14 +/- 29.7cm, MAX=187.24 +/- 28.2cm) for the involved extremity. The results demonstrate that MN values are significantly different than those obtained using the MAX score for a 3-repetition test. These results are important to consider when assessing the involved extremity of an ACLR subject. Assessment of function using only the mean score may be an underestimate of performance. To determine if there were differences between trials, two repeated measures ANOVAs with 2-within factors (Extremity, Trial) were used to assess differences between the Extremities (Involved, Uninvolved) and Trial (Trial 1-Trial 3) for the ACLR and Control groups. There was a significant main effect for Trial for both the ACLR and Control groups. Post-hoc analysis using t-tests with Bonferroni correction (.05/3=.016) determined that there were significant differences between Trial 1 & Trial 2 and Trial 1 & Trial 3 (p=.001) for both extremities of the ACLR and Control groups. There was a significant difference between Trial 2 & Trial 3 for the involved extremity of the ACLR group (p=.003) but no difference for either extremity of the control group (p >.016). These results support our visual observations that while performing a single-leg hop for distance test ACLR subjects perform differently between trials and often build confidence as the trials progress. Therefore, we suggest that a maximum test be used when assessing single-leg hop for ACLR subjects because the mean of three trials may not be representative of maximum performance.