Δ Can Use of the Modified STarT-Lower Extremity Tool in Early Follow-up Predict Pain and Disability at Two Years Post Injury?

Lucy C. Bowers, BS; Brian Noehren, PT, PhD; Joshua J. Van Wyngaarden, DPT, PhD;
Paul E. Matuszewski, MD

Purpose: The Modified STarT-Lower Extremity Tool (MST) is a 9-item questionnaire, easily administered during follow-up, which stratifies patients for risk of poor outcomes based on their attitudes towards their injury and their pain. Early administration of the MST has previously been shown to predict patient-reported outcomes at 12 months. This study extends this prior work by assessing the association between MST scores in early follow-up with long-term pain and disability outcomes. We hypothesized that patients classified as low risk at 3 months would report better 24-month outcomes.

Methods: 177 patients (41.9 ± 14.5 years) with a lower extremity fraction requiring surgical fixation and no history of chronic pain were recruited from a Level I trauma center. Patients completed the MST at their 3-month follow-up visit. Demographic and injury characteristics were extracted from the patient's medical record. At 24 months after surgery, patients completed the PROMIS (Patient-Reported Outcomes Measurement Information System) Pain Interference and Physical Function scales, Brief Pain Inventory (BPI) Pain Severity Subscale, Cincinnati Occupational Rating Scale (CORS), and Chronic Pain Grade Scale (CPGS). Patients were also assessed for chronic pain development at 24 months after surgery using the National Institutes of Health recommendation of pain present greater than 3 months and bothersome at least half the days over the last 6 months. Separate multivariable regression analyses were conducted for each outcome, controlling for ISS, age, smoking status, body mass index, and MST at 3 months.

Results: 132 patients (75%) completed this study, and 36 (27.3%) reported chronic pain at 24 months. When compared to the high-risk category at 3 months, MST low risk predicted reduced chronic pain development (odds ratio [OR]: 0.23, 95% confidence interval [CI]: 0.07 to 0.76, P = 0.016), CPGS (OR: 0.28, 95% CI: 0.09 to 0.89, P = 0.03), BPI Pain Severity (β: –1.2, 95% CI: –2.3 to –0.04, P = 0.042), and Pain Interference scores (β: –30.2, 95% CI: –51.0 to –9.5, P = 0.005), and greater Physical Function (β: 6.2, 95% CI: 1.8-10.6, P = 0.006) and CORS scores (β: 12.6, 95% CI: 3.2 to 22.0, P = 0.009) at 24 months.

Conclusion: Classification via the Modified STarT-Lower Extremity Tool administered in early follow-up is predictive of long-term pain and disability-related outcomes in patients with lower extremity fracture. This tool may be used to stratify risk for adverse outcomes and to target interventions to improve patient recovery potential.

Δ OTA Grant