Virtual Poster Session: Remote Virtual Technologies & Care | Friday June 12, 2020 1:30 - 2:50pm EDT
https://vimeo.com/showcase/7214857

20| Maryanne Siu- ONPoint Medical Inc.; Post-Doctoral Fellow

"Interrater Reliability of the Star Balance Training Mat"

Introduction: When introducing an assessment tool to clinical settings it is important that its outcome be reliable between raters. The Star Excursion Balance Test (SEBT) is a valid assessment of a patient's dynamic postural control quantified by measuring single-leg reach distance. Unfortunately, the clinical adoption of SEBT is low because it is burdensome to assess and maintain. ONPoint Medical (ONPointMed.com; London, Canada) has developed the Star Balance Training Mat, which uses a lower resolution excursion line; eliminating the need for practitioners to become ergonomically compromised when measuring reaches. The objective of this study is to determine the interrater reliability of the SEBT performed using the Star Balance Training Mat.
Methods: Twenty volunteers (10 male, 10 female; age: 38±10yr) performed the SEBT on the Star Balance Training Mat while observed by three independent raters. Each subject performed four practice reaches in each direction, then was tested twice. Each test included three reaches in each direction, and five-minute breaks were given between sessions. Each rater recorded the reach distances; and the maximum reach for each reach direction was independently assessed using an absolute Intraclass Correlation Coefficient, ICC (2,1).
Results: The ICC values ranged from 0.96 to 0.99 across all excursion directions for both stance feet, and the Standard Error of Measure (SEM) and Smallest Detectable Distance (SDD) ranged from 0.95 to 2.64 [% leg length] and 2.63 to 7.31 [% leg length], respectively.
Discussion/Conclusion: The interrater reliability of the Star Balance Training Mat performed SEBT is excellent, as only 1-4% of the variance in reach distances could be attributed to random variation. These interrater reliability metrics are improved compared the Hyong et al's 2014 assessment of the traditional SEBT (ICC: 0.83-0.93, SEM: 3.19-4.26 and SDD: 8.85-11.82).

69| Morgan A Jennings- Western University; PhD (In progress or completed)

"eVisit for Early Postoperative Follow-up"

Background: Early adverse events following elective orthopaedic surgery are rare, and early post-operative appointments are often unremarkable with no change in clinical management. Thus, our current model for early post-operative care may be inefficient.
Hypotheses/Objectives: The primary objective of the study is to collect the data necessary to build a SmartPhone application (eVisit) that presents patients with questions about their risks, pain, wound and range of motion to predict the likelihood that they are suffering an adverse event following orthopaedic surgery and evaluate its accuracy compared to the gold standard of in-person assessments.
Proposed Methods/Methods: This is a diagnostic validity study using a sample of adult patients who underwent an orthopaedic surgery at University Hospital or Victoria Hospital and are within 3 months post-operative. Consenting patients will complete the eVisit online prior to their in-person appointment (via email link) or during the wait time at their appointment. The in-person follow-up will serve as the gold standard. To obtain the actual recommendation (and therefore provide the gold standard), the surgeon will complete a form classifying whether the patient needed to be seen in-person or not (i.e. presence or absence of an adverse event).
Future Applications/Directions: If we show that the eVisit is accurate at detecting the likelihood of an early adverse event following elective orthopaedic surgery, we may be able to replace early follow-up in-person visits with eVisits. This may reduce patient and caregiver burden in terms of travelling to the clinic and reduce the use of health care resources while maintaining the same level of care in terms of safety.

75| Georgia Powell- McGill University; Masters (In progress or completed)

"Physical Activity for Children with Osteogenesis Imperfecta Through Telehealth"

Background: Osteogenesis Imperfecta (OI) is a rare bone disorder caused by a mutation in COL1A1/1A2 genes. Patients with OI type I are mildly affected yet have substantial bone fragility and muscle weaknesses. Given the strong positive relationship between muscle and bone strength, exercise interventions aiming to increase muscle strength may improve bone strength. In the context of the current pandemic, patients are facing challenges accessing frequent professional therapeutic interventions. We suggest delivering a home-based exercise intervention through telehealth, i.e., using internet teleconferencing to administer health care. This study compares two telehealth protocols, by evaluating the effect of exercise on bone mass and muscle strength in youth with OI type I.
Methods: Patients with OI type I (n=24; ages:6-21), from Shriners Hospitals for Children-Canada will be randomized into either (1) Supervised group (SG), or (2) Follow-up group (FG). The SG will be monitored every session while the FG receives monthly follow-ups, both through telehealth. Groups will receive a 16-week exercise regimen including resistance, cardiovascular, and flexibility training, beginning with thirty-five minutes 2X week. Then increasing to 45 minutes, 3X week by the 12th week. Pre/post intervention testing includes: upper and lower limb muscle function tests (grip strength and mechanography), along with bone imaging of the radius and tibia (peripheral Quantitative Computed Tomography). Post-intervention calculations of cost efficiency per group will be completed.
Expected Results: It is hypothesized the SG group achieves greater benefits than the FG group from increased participation and adherence rates. A cost efficiency comparison will establish if supervision is advantageous over a follow up approach.
Significance: Success of this project will lead to clinical implementation at Shriners Hospital, serving as a basis to provide exercise programs to youth with OI.

94| Mayar A Abbasi- KKT Orthopedic Spine Center; Masters (In progress or completed)

"MAR Analysis Training and Reliability Assessment Tool"

Background: In research, conclusions drawn from a study are only acceptable if the method used is reliable. For the Mean Axis of Rotation (MAR) analysis of the movement of the cervical spine, Amevo, Bogduk et al demonstrated in 1991 that the method used to calculate MAR in previous studies was unreliable [1]. They then presented an optimized method with proven scientific accuracy, and formally defined normal/abnormal MAR values [2]. Desmoulin used this MAR Analysis to evaluate the effectiveness of KKT Treatment in correcting abnormal MAR positions.[3] Prior to his work, Desmoulin received expert training in this optimized method directly from Bogduk, ensuring his results were valid. Future MAR researchers will also require similar training to ensure the scientific validity of their results.
Rationale: In 2019, Abbasi presented a Semi-Automated MAR Analysis software tool, which uses computer vision to accurately replicate Amevo's optimized MAR method [4]. However, the MAR tool still requires users to manually trace vertebra on digitized X-Rays. Training is required to ensure new users achieve results consistent with previous experts.
Purpose: To facilitate MAR training and validation, a separate tool was designed to compare the MAR analysis of 2 observers on the same X-Ray dataset.
Methodology: The MAR comparison tool imports the data saved by the MAR Tool, for 2 separate analysis of the same X-Ray. It then graphically overlays the traces of each tester on the X-Ray in different colors, and displays relevant comparison metrics.
Results: The report generated by the MAR comparison tool provides instant and comprehensive feedback for validating MAR Analysis data.
Significance: The MAR Comparison tool facilitates training of new MAR Analysis users and provides validation of the scientific accuracy of data for future studies.
