



USE OF A MARKERLESS MOTION-CAPTURE SYSTEM TO ASSESS LOWER EXTREMITY BIOMECHANICS IN COLLEGIATE ATHLETES: INJURY PREDICTION AND CLINICAL IMPLICATIONS

Dynamic motion analysis and lower extremity kinematics

A CLOSER LOOK

Recent studies indicate that faulty lower extremity biomechanical patterns are a predictor of lower extremity musculoskeletal injuries (LE-MSKI). The Single-Leg Squat (SLS) and Landing Error Scoring System (LESS) are two clinical tests that can identify modifiable risk factors for LE-MSKI. Presently, few efforts have examined SLS and LESS scores as a predictor of injury risk in collegiate athletes and none have used dynamic motion tracking and real-time analytics to score performance. Therefore, our research objectives were to use the SLS and LESS to predict LE-MSKI risk in Towson University student-athletes and investigate team and sex differences in biomechanical patterns. A Microsoft Kinect sensor using Athletic Movement Assessment software (PhysiMax®) was used to capture lower extremity kinematics and automatically score the SLS and LESS. To date, we have assessed SLS and/or LESS performance in over 125 student-athletes, including pre-season testing in all members of the women's field hockey, basketball, and lacrosse teams. Preliminary results have revealed that previous history of injury did not influence SLS and LESS composite scores nor were group differences found across 3 female collegiate sports. Further work will determine if SLS and LESS performance is associated with future LE-MSKI risk in collegiate athletes.

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OUTCOMES

- More than 125 student-athletes tested to date
- Interdepartmental collaboration between academic faculty (Department of Kinesiology) and sports medicine clinicians (Department of Athletics)
- Preliminary findings presented at the Inaugural College of Health Professions Undergraduate Research Symposium and the 2018 Annual Meeting of the American College of Sports Medicine

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