Free Communications, Oral Presentations: Lower Extremity Movement Screening and Injury Prevention

Wednesday, June 28, 2017, 5:00PM-6:15PM, Room 370; Moderator: Darin Padua, PhD, ATC

Prediction of Core and Lower Extremity Injuries Among High School Football Players

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Context: Multivariable prediction models are needed to identify high-risk athletes through pre-participation screening. To date, few studies have identified risk factors through predictive modeling in high school athletes. **Objective:** To identify pre-participation screening measures that demonstrate a substantial association with subsequent core or lower extremity (CLE) sprain or strain among high school football players. **Design:** Retrospective and prospective cohort study. **Setting:** Athletic facilities. **Patients or Other Participants:** 61 high school football players (Age: 15.4 ± 1.2 years, Height: 1.80 ± .08 m, Mass: 80.31 ± 15.07 kg,). **Interventions:** Pre-participation injury risk screening. **Main Outcome Measures:** Retrospective and prospective analyses were performed to assess associations between screening measures and injury. The retrospective injury definition was any CLE sprain or strain that resulted in sport time loss, whereas the prospective injury definition was any CLE sprain or strain during the season that required evaluation and treatment. Horizontal trunk hold (HTH) time to failure was used as an indicator of core muscle endurance. The Y-balance anterior reach (Y-AR) distance, represented as the percent of leg length, was used to assess balance and mobility. Power was assessed by a unilateral vertical jump (UVJ), using an instrumented mat. Ankle inversion strength was measured by a hand-held dynamometer. A 0-100 Sport Fitness Index (SFI) score was used to quantify persisting effects of previous injuries. Prediction models were developed from receiver operating characteristic and logistic regression analyses. **Results:** A 3-factor retrospective prediction model for time loss CLE injury included SFI (Adj OR = 4.42), HTH (Adj OR = 2.23), and Y-AR asymmetry (Adj OR = 1.40). The odds for previous CLE injury were 3.7 times greater among players who exhibited any 2 of 3 risk factors (90% CI: 1.27, 10.57). A 5-factor prospective model for CLE sprain or strain included inversion ankle strength asymmetry (Adj ORj = 5.19), Y-AR asymmetry (Adj OR = 3.59), SFI (Adj OR = 3.16), Y-AR percent leg length (Adj OR = 2.65), and UVJ asymmetry (Adj OR = 2.39). The odds for a CLE sprain or strain was 8 times greater among players who exhibited any 4 of the 5 risk factors (90% 2.77, 24.43). **Conclusions:** Pre-season screening results can be used to estimate the injury risk level of individual high school football players. Pre-season and post-season assessments are integral components of a longitudinal approach to injury risk reduction, which can facilitate individualized training that targets remediation of bilateral performance asymmetries.

Functional Movement Screen and Overuse Injuries in Collegiate Club Sport Athletes

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Context: Overuse or chronic injuries are common in the lower extremity, limit participation, and their treatment uses considerable athletic training resources. Pre-season screens are typically used to predict acute injury risk. However, it is unclear if Functional Movement Screen (FMS) scores are associated with subsequent occurrence of lower extremity overuse injuries. **Objective:** To determine if pre-season FMS composite scores were different in club sport athletes who did and did not develop an overuse injury during an academic year. We hypothesized those with an overuse injury would have lower pre-season FMS composite scores. **Design:** Cross-sectional. **Setting:** Biomechanics Laboratory. **Patients or Other Participants:** Volunteer collegiate club rugby and ultimate frisbee athletes (n = 40; 20 female [13 rugby, 7 ultimate], 20 male [12 rugby, 8 ultimate]; age = 20.7 ± 1.7 yrs; height = 172.2 ± 8.6 cm, mass = 74.9 ± 16.2 kg). **Interventions:** Participants were consented, interviewed for injury history, and screened by an experienced rater at the beginning of the academic year prior to their club sport participation. Overuse injury was defined as one without a traumatic mechanism, with a gradual onset, that lasted more than 2 weeks. Participants entered physical activity and injury occurrence weekly via online surveys for an academic year, August to May. Acute injuries with a clear mechanism, concussions, contusions, and abrasions were excluded. Participants may have reported >1 overuse injury, but were only counted once in the overuse injury group. **Main Outcome Measures:** FMS composite scores were transformed into ordinal