TUCK JUMP ASSESSMENT AS AN INDICATOR OF PREVIOUS UPPER EXTREMITY INJURY

Barfield J, MS and Oliver G, PhD

Sports Medicine & Movement Laboratory, School of Kinesiology, Auburn University, Auburn, Alabama

OBJECTIVES

The Tuck Jump Assessment is a dynamic assessment for lower extremity injury susceptibility.[2-5] The purpose of the Tuck Jump Assessment is to identify postural neuromuscular imbalances, throughout the dynamic movement, that could potentially result in greater injury susceptibility.[3] With the focus of neuromuscular imbalances on Tuck Jump Assessment performance, and the common notion of the body acting most efficient when there is proximal stability for distal mobility,[1] we sought

- **To determine if the Tuck Jump Assessment can be used as a dynamic movement assessment to ascertain a previous history of upper extremity injury in overhead throwing**.
- **We hypothesized that a more flexed trunk and less elevated upper leg at the peak of the jump would correlate with previous history of upper extremity injury for the overhead athlete.**

DISCUSSION

The Tuck Jump Assessment has been created by clinicians to identify high-risk landing mechanics and provide direction regarding lower extremity injury.[7] **When it comes to upper extremity injury, simplifying the variables examined in the Tuck Jump Assessment to those that fall into proximal body control category does not help identify previous upper extremity injury for the overhead athlete.**

- Injury classification was a practice and/or game missed due to upper extremity injury.
- Because a link between baseball players exhibiting throwing shoulder and elbow pain with knee and low back pain has been established, examination of the trunk and lower extremities should also be considered in those throwing athletes with upper extremity injury.[8]
- **A direct link was not found between the Tuck Jump Assessment and upper extremity injury.**

The current study only examined trunk flexion and upper leg elevation, further evaluation should include variables of fatigue, distal landing patterns, and proximal control in attempt to obtain the most benefit of the Tuck Jump Assessment in injury assessments.[6]

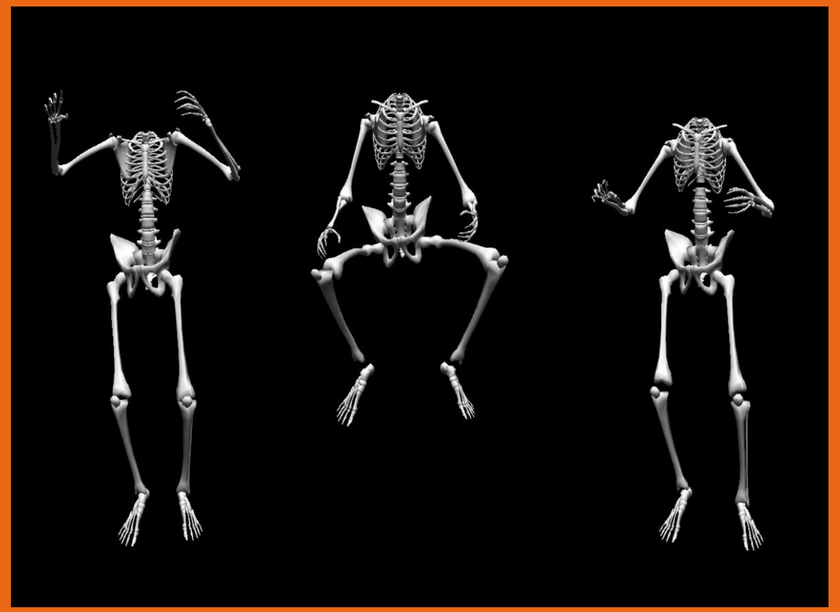
- **A simplified unidimensional construct of the Tuck Jump Assessment may not be the best way to use this dynamic movement assessment to identify previous upper extremity injury.**
- Future research should consider examining the relationship between fatigue as determined in the Tuck Jump Assessment with upper extremity injury.

Limitations to this study include using a survey to identify the injured group. Perhaps a test of scapular dyskinesis to separate groups would have been more reliable and shown more of a relationship with Tuck Jump Assessment variables. Other limitations include a limited injured group sample size and time away from injury. All participants that reported for this study were presumed injury free for the past 6 months. The time away from injury may be enough to correct kinetic chain deficiencies.

METHODS

Seventy-one youth baseball and softball athletes **(28 baseball/43 softball; 12.41 ± 2.22 yrs.; 161.98 ± 13.65 cm; 59.17 ± 14.90 kg)** in good physical condition and no injuries in the last six months participated. Auburn University's Institutional Review Board approved all testing protocols. Informed written consent was obtained from each participant and participant's parents before testing.

- A health history form was completed by the participants prior to participation.
- Having an injury in the past year that had kept them from competition, placed participants in the **previous injury group (*N* = 18).** All other participants were placed into the **no previous injury group (*N* = 53).**
- Kinematic data were collected at 100 Hz using an electromagnetic tracking system.
- Jumping instructions were to pull knees as high as possible aiming to reach a position with thighs parallel to the ground and immediately begin the next tuck jump once landing.[2]
- A trial of 10 tuck jumps was collected. Analysis included jumps 4 through 8 to mitigate the Hawthorne effect.
- Values for trunk flexion and upper leg elevation were taken from peak leg elevation and averaged, and a priori was set at a level of $p = 0.05$ to determine significance.



RESULTS

A logistic regression showed no significance in trunk flexion or upper leg elevation being able to determine upper extremity injury (χ^2 (1, N = 71) = 3.55, p = .315). The model explained 7.2% of the variance in upper extremity injury and correctly classified 73.2% of all cases.

Table 1. Descriptive statistics for trunk flexion and bilateral upper leg elevation.

Predictor	Injured	Healthy
Trunk Flexion°	-24.14 (12.87)	-18.89 (12.71)
Right UL Elevation°	73.41 (14.49)	67.47 (16.85)
Left UL Elevation°	76.27 (13.52)	68.41 (19.04)

Note: *Data is presented in table as Mean(SD). Trunk Flexion = (+) extension/ (-) flexion; UL Elevation = (+) more elevated*

CONCLUSIONS

- The Tuck Jump Assessment is a complex dynamic movement assessment which has 10 points of potential deficits for the clinician to be aware.
- Examining only trunk flexion and upper leg elevation during the Tuck Jump Assessment is not enough for clinicians to recognize previous upper extremity injury.
- **Simplifying the dynamic movement assessment while not specifying the type of upper extremity injury is not favorable for the clinician to identify previous injury.**

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Contact Information:
Jeff Barfield, Sports Medicine & Movement Lab, Auburn University
301 Wire Rd. Auburn, Al. 36849
www.sportsmedicineandmovement.com www.sportsmedicineandmovementau.com
jzb0123@tigermail.auburn.edu