A Possible Alternative to Computerized Neurocognitive Testing for Quantification of Reaction Time

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BACKGROUND AND PURPOSE
- Computer programs are widely used to assess neurocognitive function, which is adversely affected by concussion.
- Previous research has shown moderate correlations between values derived from ImPACT® and CogSport®.
- A modest correlation has been reported between drop RT and CogSport® choice RT.
- Disadvantages of neurocognitive testing are cost and impracticality of large-group pre-participation testing.

METHODS AND PROCEDURES
- RT-drop stick instrument was constructed from regulation hockey puck and a 7/16-inch dowel rod.
- Drop stick procedure compared to Choice RT derived from ImPACT® testing (Figure 6).
- Simple RT derived from drop-stick movement, grasping with thumb and index finger (Figure 4).
- Simple RT appears to represent a visual-motor protective response?

RESULTS
- Simple RT testing performed according to standard procedures.
- Both RT measurement procedures performed on same day for non-athletes.
- Both Choice and Simple RT values were smaller for males than females, but there were no significant differences.

CONCLUSIONS
- Previous research has demonstrated a modest correlation between ImPACT® and CogSport® choice RT values.
- A relatively weak correlation has been reported between drop-stick Simple RT and CogSport® Choice RT.
- No meaningful correlation was observed between drop-stick Simple RT values and ImPACT® testing (Figure 6).
- Simple RT appears to represent a visual-motor response that does not require cognitive processing.
- Simple RT may still be a valid indicator of a neurological capability that may be adversely affected by concussion.
- Further research is needed to establish the possible relevance of Simple RT to injury risk and concussion recovery.

PARTICIPANT CHARACTERISTICS
- 107 college students (20.9 ± 0.12 years, 1.79 ± 0.12 meters, 84.91 ± 20.80 kilograms).
- 63 males and 44 females; 53 athletes and 54 non-athletes; 34 participants had a history of concussion.
- Exclusionary criterion: Concussion occurrence within 2 months prior to testing.

Table 1

<table>
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<th>Group</th>
<th>Gender</th>
<th>Mean</th>
<th>Std. Deviation</th>
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<td>Choice RT</td>
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<td></td>
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REFERENCES
1. Eckner JT, Lipps CB, Lipps BO. CogSport testing (Figure 5). A comparison of contemporaneous and previous research findings. Neuropsychol Rehabil. 2007;35:943-947.

Image 1

Figure 1

Figure 2

Figure 3

Figure 4

Figure 5

Figure 6