

Brain Injury >

Volume 34, 2020 - [Issue 3](#)

574 | 8  
Views | CrossRef citations to date | Altmetric

Articles

# The ability of CNS vital signs to detect coached sandbagging performance during concussion baseline testing: a randomized control trial

M. N. Anderson [✉](#), L. B. Lempke, D. H. Bell, R. C. Lynall & J. D. Schmidt

Pages 369-374 | Received 15 Apr 2019, Accepted 28 Jan 2020, Published online: 06 Feb 2020

[Cite this article](#) <https://doi.org/10.1080/02699052.2020.1724332>



Sample our  
Medicine, Dentistry, Nursing  
& Allied Health Journals  
>> [Sign in here](#) to start your access  
to the latest two volumes for 14 days

[Full Article](#)

[Figures & data](#)

[References](#)

[Citations](#)

[Metrics](#)

[Reprints & Permissions](#)

[Read this article](#)

[Share](#)

## ABSTRACT

**Objective:** Despite widespread use of baseline neurocognitive testing in concussion management, suboptimal performance due to sandbagging still readily occurs without detection. The purpose of this study is to determine CNS Vital Signs validity indicator accuracy in detecting coached sandbagging compared to controls.

**Method:** We compared rates of invalidity and domain composite scores for neurocognitive test performance between two groups of twenty-five college-aged students (age =  $20.8 \pm 1.1$  years, range 18-25, 48% female) completing CNS Vital Signs instructed to either 1) give their best effort (control) or, 2) give suboptimal

performance (sandbag). The sandbagging group was given standardized instructions on how to sandbag without detection. All participants rated their effort after completing on a Visual Analog Scale (0–100 mm).

Results: Built in invalidity indicators successfully identified 68.0% of sandbaggers, while only 12% in the control group presented with invalid scores. Participants in the sandbagging group on average reported significantly lower effort (sandbag:  $51.0 \pm 21.0$ , control:  $86.0 \pm 12.0$ ,  $p < .001$ )

Conclusions: Built-in CNS Vital Signs validity indicators have an overall high accuracy in identifying those attempting to purposefully sandbag and are comparable to other computerized neurocognitive tests. Given that 32% of intentional sandbaggers went undetected, clinicians should consider additional safeguards to detect these individuals at baseline.

KEYWORDS:

Psychometric mild-traumatic brain injury neurocognitive testing

## Declaration of interest

The authors report no declarations of interest.

## Related research

People also read

Recommended articles

Cited by  
8

[Minimal Gender Differences on the CNS Vital Signs Computerized Neurocognitive Battery >](#)

Grant L. Iverson et al.  
Applied Neuropsychology: Adult  
Published online: 14 Jun 2013

Brian L. Brooks et al.  
Child Neuropsychology  
Published online: 24 Jan 2019

## Information for

Authors  
R&D professionals  
Editors  
Librarians  
Societies

## Opportunities

Reprints and e-prints  
Advertising solutions  
Accelerated publication  
Corporate access solutions

## Open access

Overview  
Open journals  
Open Select  
Dove Medical Press  
F1000Research

## Help and information

Help and contact  
Newsroom  
All journals  
Books

## Keep up to date

Register to receive personalised research and resources by email



Sign me up



Copyright © 2026 Informa UK Limited [Privacy policy](#)

[Cookies](#) [Terms & conditions](#) [Accessibility](#)

Registered in England & Wales No. 01072954  
5 Howick Place | London | SW1P 1WG



**Taylor & Francis**  
by informa