'Brain vital signs' detect concussion-related changes

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(HealthDay)—Brainwave monitoring can detect concussion-related brain

changes as well as subclinical impairment in hockey players, according to a study recently published in *Brain*.

Shaun D. Fickling, from Simon Fraser University in Vancouver, British Columbia, Canada, and colleagues developed a portable evoked potential framework to extract "brain vital signs" using electroencephalography. The brain vital signs were derived from well-established evoked responses representing auditory sensation, basic attention, and cognitive processing amplitudes and latencies converted to normative metrics (six total). These brain vital signs were tested to detect concussion-related neurophysiological impairments among 47 male ice hockey players over two seasons.

The researchers found that 12 players sustained concussions after baseline testing and completed postinjury and return-to-play assessments, while 23 players were not diagnosed with a concussion during the season but completed both baseline and postseason testing. Concussions led to significantly increased amplitude and delayed latency scores for all six brain vital signs. At return-to-play, significant changes were detected in basic attention amplitude, indicating persistent subclinical impairment. Among nonconcussed players, there were significant changes between baseline and postseason, with decreases in cognitive processing speed and overall total score.

"The results demonstrate the importance of an objective physiological evaluation of potential concussion effects over time," the authors write. "They address a major challenge faced by practitioners—the lack of practical, objective, evidence-based approaches deployed at the point of care to inform critical decisions for concussion management on sports."

Several authors are associated with HealthTech Connex, which could qualify them to benefit financially from the commercialization of a platform capable of measuring brain vital signs.

More information: Abstract/Full Text