

## EDGEWISE

A concussion is a traumatic brain injury caused by a blow to the head or body, a fall or another injury that jars or shakes the brain inside the skull. Although there may be cuts or bruises on the head or face, there may be no other visible signs of a brain injury.

With rest, most people fully recover from a concussion. But in rare cases, especially with repeat injuries, concussions can lead to long-lasting problems with movement, learning or speaking. It's important to contact a doctor if you or someone you know has symptoms of a concussion. More about symptoms: [bit.ly/healthlink-concussion](http://bit.ly/healthlink-concussion)

Football trainers asked by researchers about concussion estimate that between 2 and 6 per cent of their players suffered one during the season. But when players were asked about symptoms they experienced in that period, without using the word concussion, up to 70 per cent reported concussion-like symptoms.

Based on Christie's NeuroTracker findings, multiple concussions may have a cumulative effect on a person's ability to process thoughts (cognition). This effect becomes most evident after the age of 30. More research is needed to determine if multiple concussions early in life have a greater impact on cognitive function as a person ages.

NeuroTracker software was intended for elite athletes, but a group of bridge-playing Greater Victoria seniors who did seven weekly sessions as part of an ongoing UVic research study reported a noticeable improvement in their bridge games and performed better on a cognitive task.

To find out more about Christie's concussion project visit [bit.ly/uvic-christie](http://bit.ly/uvic-christie) or email [brainlab@uvic.ca](mailto:brainlab@uvic.ca) to be part of ongoing studies.



# THE UNSEEN INJURY

Christie, with two volunteers using the NeuroTracker software. UVIC PHOTO SERVICES

## Public awareness is essential to protect young athletes from the dangers of concussion

by Jody Paterson

Research into the mysteries of concussion remains a priority for health professionals trying to better understand a complex condition, says University of Victoria brain researcher Brian Christie.

But educating families, schools and coaches on what's already known is equally important to help protect children and youth in amateur sport from a concussion, a traumatic brain injury typically caused by a blow to the head or body.

Until 2012, Christie's research had been focused on how exercise benefits brain function. That's when the issue of concussions emerged during a visit with training staff for the Vancouver Canucks.

The players were using NeuroTracker, a software program developed to improve performance in elite athletes. When the trainer noted that players who didn't do well with NeuroTracker were those who'd had a concussion, Christie wondered whether the game could be used to gauge the impact of a concussion.

Fast-forward five years, and Christie and his

students in the Division of Medical Sciences have since used NeuroTracker to assess hundreds of individuals.

The work could lead to an objective test for concussion, which doesn't yet exist.

"Concussions are an unseen injury," says Christie. "You see a disruption in cognitive performance in the absence of any structural damage; things aren't working right, but there's no obvious reason why. It's important that schools and sports teams understand what concussion is and what to do about it with their athletes and students."

Christie and his students recently used the Sport Concussion Assessment Tool (SCAT) for baseline testing with a boxing team headed for a provincial championship. Until an objective test is found, using SCAT before a competition is useful for comparison purposes in the event an athlete gets concussed.

Christie's NeuroTracker research has confirmed lower game scores by as much as 40 per cent for someone with a history of concussion. Victoria businessman Gerald Hartwig—an extreme-sports enthusiast who has had 12 concussions—was so impressed with NeuroTracker after enrolling as a research subject that he now

financially supports Christie's work. (Most of UVic's concussion research is funded by the Canadian Institutes of Health Research.)

Local donors are also supporting the research of one of Christie's students into changes in heart-rate variability in young soccer players after "heading" the ball, with the recently created Jimmy Spencer Memorial Award helping to fund that work.

Heading has long been thought to cause concussion-like injuries, and the research will help determine that with more certainty, says Christie. "The students put their heart and soul into this research, and we're so appreciative for how supportive the community has been."

With evidence now emerging from Christie's lab that regular sessions with NeuroTracker may improve cognitive function in the elderly, the team is working with UVic's Institute on Aging and Lifelong Health and an enthusiastic cohort of elderly subjects. Early results are promising.

"Some of these participants feel that working with the NeuroTracker has been beneficial for their bridge games," he says. "So, we've got quite a happy group of card players coming into the lab."