

Study suggests a new tool for diagnosing post-concussion syndrome

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Repeated concussions or other mild traumatic brain injuries can lead to prolonged symptoms and impaired quality of life. Understanding the underlying cause and accurately identifying post-concussion syndrome, a common medical condition that develops after head trauma, is not a simple matter.

Researchers at St. Michael's Hospital conducted a systematic review of 10 international studies that indicated [diffusion tensor imaging](#), an MRI-based neuroimaging method that allows for visualization of white matter tracts within the brain, may be an effective diagnostic tool for identifying and predicting the likelihood of an individual developing PCS following a mild [traumatic brain injury](#), such as a concussion.

These findings were published online this week in *Frontiers in Neurology*.

"Many people are suffering from headaches, ongoing sleep problems, and other health issues that significantly impact their quality of life," said Dr. Michael Cusimano, a neurosurgeon and scientist at St. Michael's. "We need to find a way to help doctors to accurately diagnose these patients early so that early treatment can be started to prevent long-term and more serious problems from developing."

Unlike more common diagnostic tools, including [magnetic resonance imaging](#) and computerized axial tomography scan, diffusion tensor imaging, or DTI, effectively scans for micro abnormalities that may often go undetected by routine scanning.

The research study concluded that:

- Abnormal DTI readings were linked to an increased number and severity of PCS symptoms.
- Finding even minor damage to the corpus callosum, an area of the brain responsible

for relaying messages to coordinate motor, sensory and cognitive information, may be associated with lasting behavioural, emotional and cognitive impairments in patients with [mild brain injury](#).

- DTI testing can detect damage not picked up by more common imaging methods like CT scans.

"DTI is a valuable technique that allows us to get a closer look at small, but impactful, abnormalities," said co-author Dr. EYESHA Hashim, a postdoctoral fellow with St. Michael's Trauma and Neurosurgery Services. "It holds tremendous potential for correctly identifying the onset of post-concussion syndrome."

Today's diagnosis of PCS heavily depends on a combination of patient's account of symptoms, clinician's judgment, and medical criteria. Routine use of DTI in a clinical setting could help strengthen the diagnosis, and with more accurate diagnosis, better treatment can be developed. Dr. Hashim said.

Provided by St. Michael's Hospital

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