

Physio North now offering physiotherapy for concussions



By Bill Kilpatrick

When most people think of physiotherapy they think of people who have injured their arm, leg, shoulder, neck, or back or they relate it to post-surgery rehabilitation, but few people associate physiotherapy with mild traumatic brain injuries or concussions, but with recent research advancements that is now a form of physiotherapy that is being offered at Physio North by Physiotherapist Melanie Dalley.

Dalley explains that research into treatments for concussions have advanced over the years and that initially concussions - what causes them, what symptoms are associated with them, and effective treatments- were not as fully understood as they are now.

?The research has developed into more understanding,? says Dalley, ?which leads to better rehabilitation.?

One of the first things that people need to understand, says Dalley, is that people used to distinguish between different ?types? of concussions such as ?mild, medium and severe? or ?grade 1, 2, or 3,? but that terminology is not used anymore, ?either you have a concussion or you do not. There is no grading that occurs anymore,? says Dalley adding that all concussions are now referred to as a ?mild traumatic brain injuries.?

Dalley distinguishes between a severe traumatic brain injury that would be a stroke or a skull fracture resulting in a coma, a moderate traumatic brain injury that would require surgery, and a concussion, which unless accompanied by one of the

aforementioned injuries, is now always considered a mild traumatic brain injury.

One of the other developments, explains Dalley, is that researchers no longer ascribe to the belief that a person must hit their head to have a concussion. Now, says Dalley, researchers have found that there is a range of force that will cause a concussion. Previous thinking was that a concussion was only caused by the skull striking an object then the brain striking the skull, which in medical terms is called a coup injury. It was believed that when the brain bounced back and struck the opposite side of the skull, this, called a contrecoup injury, when combined with the coup injury, was what was believed to cause concussions.

Research now shows that brain trauma can happen under four different processes as outlined in a 2015 article by the National Academy of Engineering which states that brain trauma occurs when a person has a 'direct head impact with or from an object (e.g., windshield, floor, another helmet, or projectile), whiplash with no direct head contact, vertical deceleration of the body (e.g., impact between the pelvis and ground), or stress force to the body remote from the head (e.g., high-pressure hit to the thorax).'

And these processes, as the article goes on to point out, are dependent on things like 'magnitude of the impact, stress rate and duration of the impact, direction of the impact and the body part impacted (e.g., angle of attack on the head, thorax), protection and neck strength (proportion of the momentum transferred to the body mass).

When one of these injuries happens, says Dalley, it causes a neural shearing which means that there is a stretching and tearing of the nerve cells in the brain. The National Academy of Engineering article estimates that the stretching must occur beyond what they call the 'critical point' of 10 per cent and when the neurons hit this point, 'there is a loss of the electrical polarization needed for neuronal functioning and the neural membrane fails' leading to what she calls an 'electrical storm that causes everything to go a little bit wonky.'

The wonkiness that Dalley is referring to is a result of swelling in the brain which according to the article leads to the 'dysfunction of the neurons' and, as the article further points out, if a whole bunch of neurons experience this at the same time, they will need time to 'reset' so they can once again function properly.

The time needed for the neurons to reset, or, in other words, for the concussion to heal is 30 days. 'They have done a ton of studies and what they have found is that all concussions heal within 30 days,' says Dalley adding that, 'some people can heal sooner than that.' However, where people often run into serious issues is when they experience a second concussion 'called second impact syndrome- while they are still healing from the first. And this, says Dalley, can prolong concussion symptoms and healing for an extended period of time, or worse it can lead to death as the engineering article points out stating that, 'Since the late 1990s it [second impact syndrome] has been recognized as an eventual cause of death in 50 per cent of cases. Most commonly reported in football, secondary impact syndrome can occur during any sport that can produce head blows.' 'The big caution with concussions,' says Dalley, 'is don't get another one.'

Another major change in how concussions are treated, explains Dalley, is people are no longer told to go into a dark room with no noise or other stimulation until the symptoms have improved. 'It is definitely necessary to rest immediately after a concussion,' cautions Dalley, 'say up to five to seven days, but now it's called moderate rest and it's cautious rest.' What this means is that once a patient is diagnosed with a concussion they are guided by a professional to partake in activities that brings them to what Dalley calls the 'sub-symptom threshold,' which can improve symptoms by 50 per cent, a process called habituation. This is why Dalley says that, 'It's really important to see someone who knows what they are doing early in your recovery phase.'

The problem with the previous treatments, explains Dalley, is that people were avoiding bright lights, loud noises, and visual stimulation so much that their brains adapted to that lack of stimulation, thus making it harder to return to normal even after their concussions had healed.

'We found that just sitting with sunglasses on all day long would just prolong that symptom to the point that it would take way longer to heal,' says Dalley, 'also you become reliant [on that change]' to the point that you fear the symptom. 'It's recovery based treatment, but it's also psychologically based treatment,' says Dalley.

An article on the Concussion Alliance webpage states that one of the defining aspects of a concussion patient's experience is stigma and it showed up almost immediately while writing this article. One of the people interviewed for this article asked that they not be named for fear of repercussions from their employer and their volunteer organizations, so they will be called John. For John, who has been suffering from concussion symptoms for over eight years, life continues to be a challenge. Concussions impact multiple aspects of an individual's functioning, according to the article, and those include: cognitive functioning such as concentration, memory, information processing, and executive function along with motor skills such as reaction time and coordination. Concussions also impact your vestibular system including balance, dizziness, vision/oculomotor function, and your physical wellbeing by causing headaches, neck pain, and sleep disturbances.

John, who worked in a job that required prolonged concentration, screen time, and high stress, the concussion was devastating. Prior to John's concussion he admitted to being sceptical of those who had complained about concussion symptoms, but one concussion changed all that, "I had no idea it would be like this," said John who not only forgot the name of a co-worker he had known for 15 years, but would often draw blanks about his own children's names.

"I remember driving to work [shortly after the concussion] and by the time I got to downtown I was gripping the steering wheel because my peripheral vision was like it was on fast forward. When I got to work it was like a cloud, everything was so foggy, I was nauseous, I couldn't focus, I was floating, my head was pounding, so I finally called the doctor."

John was eventually diagnosed with a concussion and told to take two weeks off of work, stay in a dark room, don't go onto his phone or watch TV, but John, like many people who are diagnosed with a concussion was eager to return to his old life, so he chose to go back to work before the concussion had healed. "I honestly thought, yeah, it's not gonna be two weeks," so John continued to try and function normally. "It took me a long time to just get over the noise and light sensitivity, the nausea, and the headaches," said John.

John also spoke about the social impact that the concussion had on him in terms of not wanting to go out into public because the simplest of tasks - just having a conversation - was so difficult because John could not remember simple things like certain words, the name of a spoon or a cup, and would struggle to form a sentence. "It's like there was no [neural] connection there," says John, "The only way I can describe it is that the memory pathways that you would normally use to recall information were disconnected. Normally when you forget something you try and retrace your memories until it pops back, but I couldn't retrace the memories." The result was long awkward pauses in conversations and odd looks from friends who didn't know what was going on with John, who at the time also didn't know what was happening either. John explained that the concussion didn't impact all his neural functioning the same way, which is what made it so difficult to explain, because he could do some things with no difficulty, but other simple tasks seemed impossible. Now, eight years later, John is more self aware and tends to only have symptoms when he is tired, but nonetheless, the symptoms remain.

The way to prevent ongoing symptoms, says Dalley, is to do those activities to a threshold. "If a person complains that they get dizzy when they stand up the way we deal with that is by getting them to stand up," but only to a certain point and then we have them rest.

"You need to do the things that create your problems," reiterates Dalley adding that, "You actually have to relearn how to integrate yourself into those activities. If you just avoid it you may not actually get the ability to do it [normally] again."

Dalley spoke about the importance of oxygen to the brain to help it heal and how one of the new assessments that they do, called the Buffalo Concussion treadmill test, does just that. Dalley puts a patient on a tread mill where they measure the patient's heart rate and ability to tolerate inclines and resistance while monitoring for concussion symptoms. She then calculates a target heart rate that the patient tries to aim for to ensure the brain is getting oxygen, while avoiding concussion symptoms.

"Initially you're supposed to be resting and doing nothing, but now they have found that maybe within five days we need to be walking, and getting some fresh air and oxygen because oxygen is necessary for healing."

Other than some cognitive tests, such as the Sport Concussion Assessment Tool and the Immediate Post-Concussion Assessment and Cognitive test, there are no diagnostics for concussions, says Dalley., ?If you have concussion symptoms and get a CT scan or an MRI it will come back normal, but if you have a moderate to severe brain injury it won't come back normal.?

When people have ongoing lingering problems two or three months after their concussion, says Dalley, it's often a result of them not receiving treatment soon enough. So, her main message is that if you suspect that you have a concussion seek medical advice immediately and begin physiotherapy as soon as you are able. While concussions are complicated and often impact everyone differently, Dalley knows that the best way to avoid ongoing symptoms is to not get another concussion and seek treatment as soon as possible.

For more information Physio North call 613-332-1010.