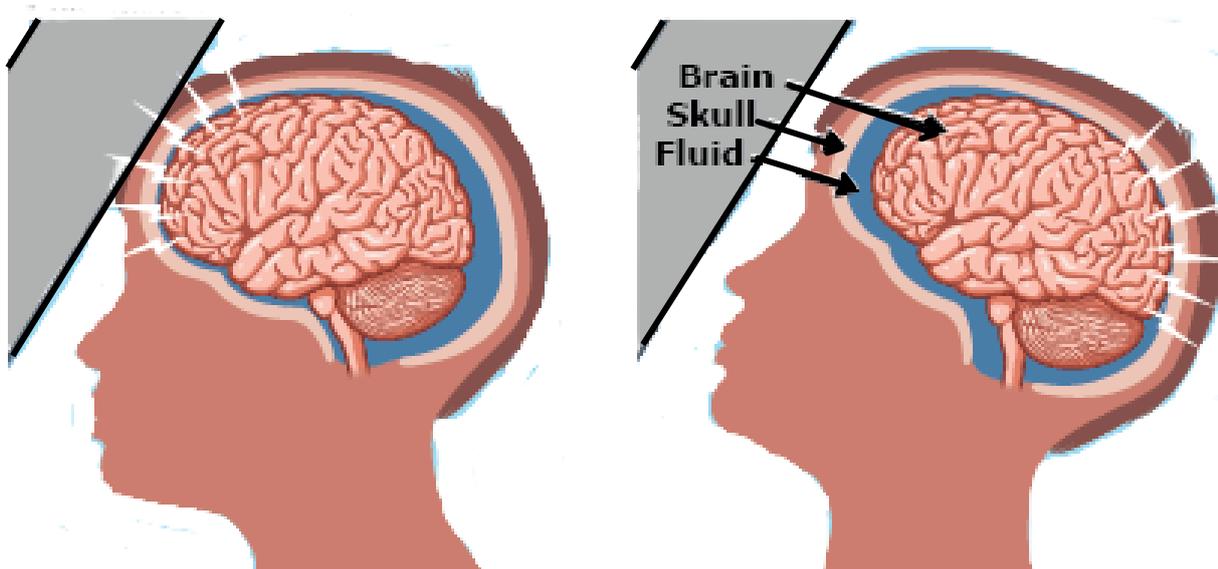


The understanding of what a concussion is and its impact on your over-all health has been evolving and changing over decades. The prevailing understanding of the condition was that it is very much a “brain bruise”.

What was thought to be happening is that since your brain is floating in fluid inside your skull, with high velocity impact or trauma, it is literally hitting the boney skull and depending on where and how that happens, it is affecting brain function. It was a simple model that unfortunately led to what we now know to be inappropriate recommendations.



Most people are told to rest, take time off from work and avoid sports immediately after the concussion. It was assumed that this injury will follow a certain natural path of recovery where rest is often indicated and appropriate. Unfortunately, we took a model of healing that works for other mechanical structures in the body and applied it to a highly regulated and functional neurological structure like the brain.

This opened us up to a large number of patients who suffered concussions that never reached 100% recovery. In fact, most with persistent symptoms would report only 50% improvement. This affects your quality of life, ability to make a living, participation in sports and frankly – poor long-term outcomes as your body ages.

Mechanism of Concussions

1



At rest, the shape is uniform



When external force is applied, a stretch occurs temporarily, changing the shape

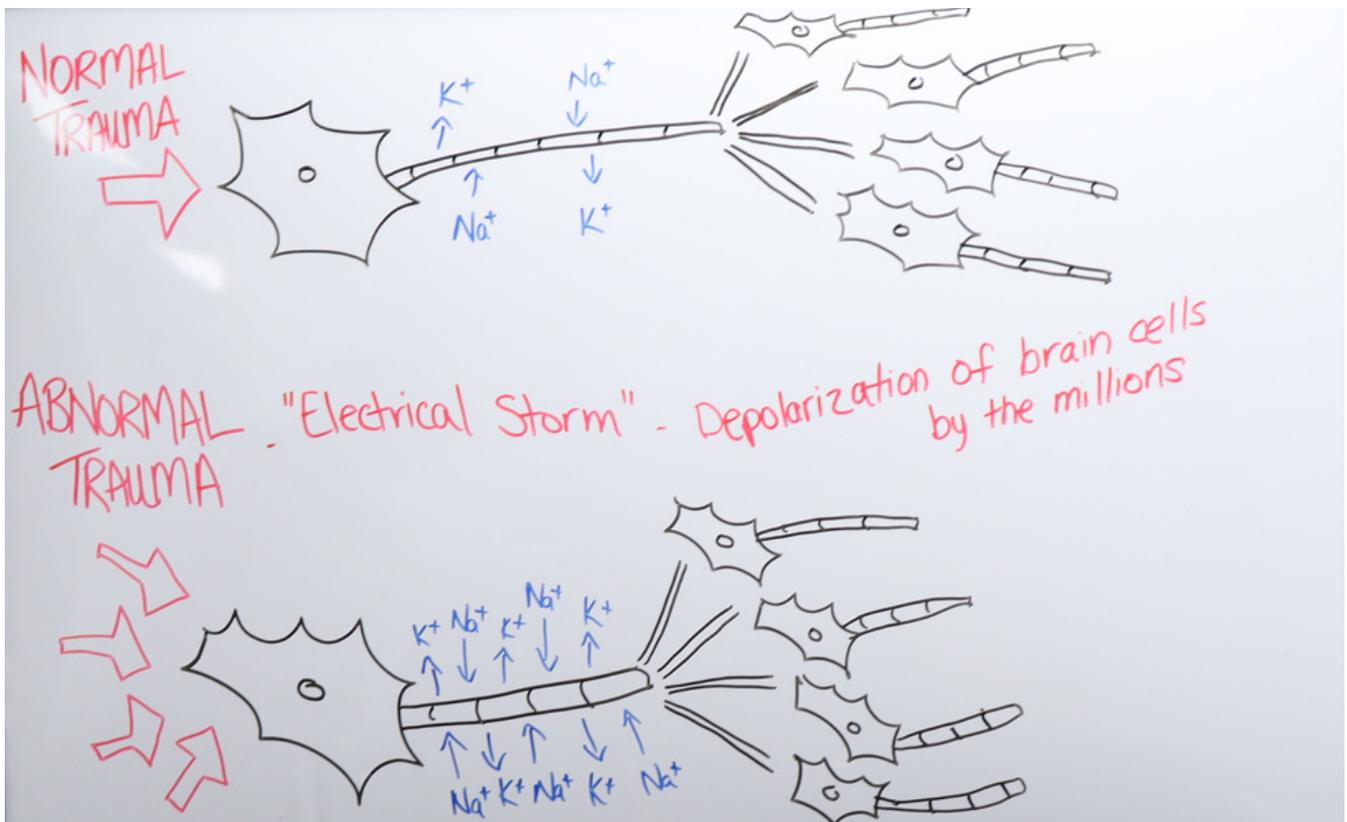
Most concussions are caused by an acceleration & deceleration injury - usually associated with a high velocity impact or abrupt change in position. Your brain is a neurological structure and your nerves, just like other tissues in the body have certain stretch and elastic properties. When that immediate acceleration & deceleration injury occurs, you go through a very dynamic stretch of the brain tissues where it changes shape as it stretches.

The analogy would be one of jello that you are holding on a plate in your hand. As you move your hand side to side, the top of the jelly will lean over the bottom as it accelerates and decelerates with movement. When it happens in the brain, this applies a lot of functional stress on the deeper white matter of the brain and depolarizes brain cells by the millions.



Mechanism of Concussions

2



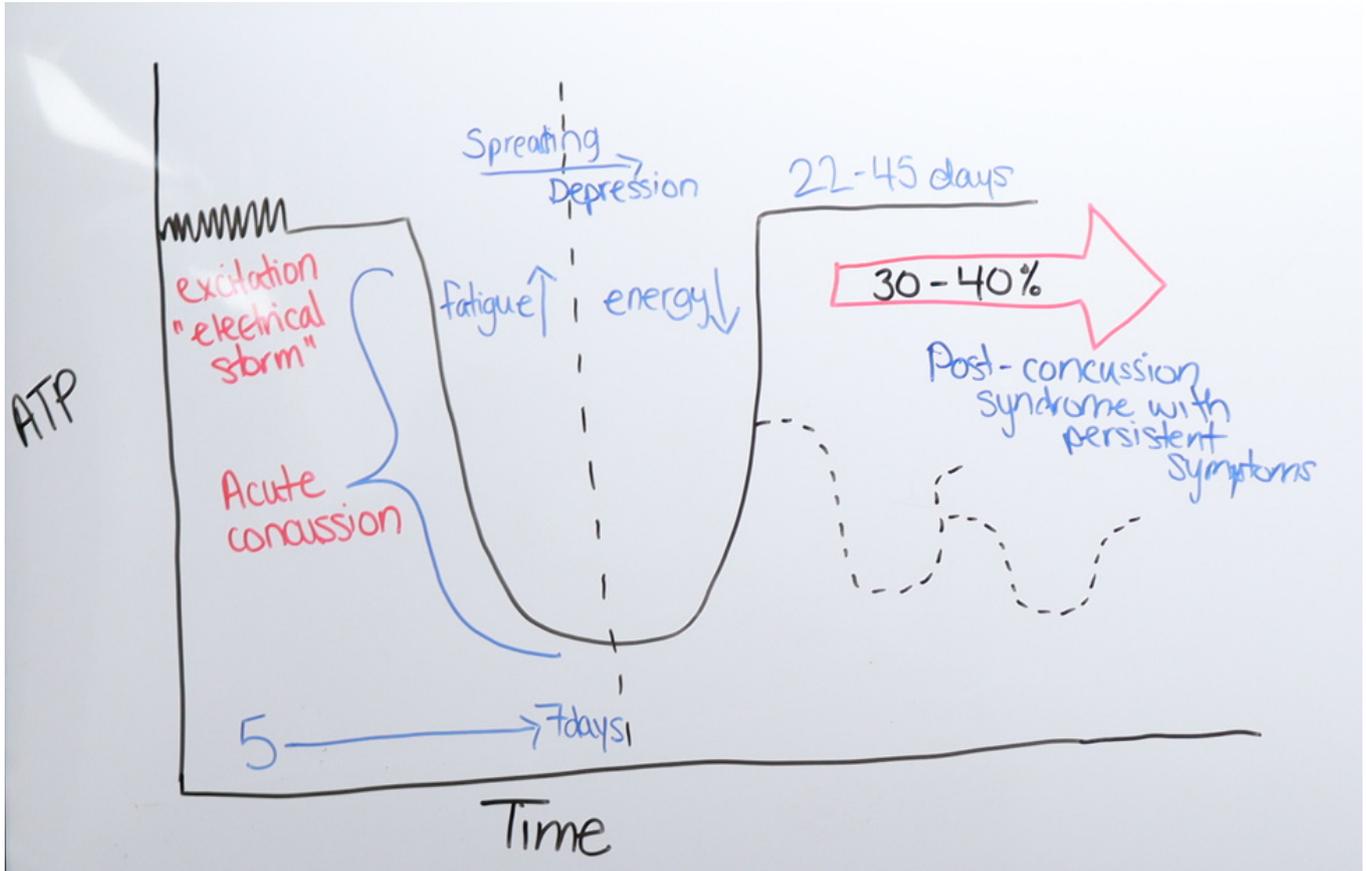
Your brain is made up of trillions of cells that communicate with thousands of neighboring cells around them, grouping together to control specialized functions. It takes a certain amount of stimulation by surrounding cells for the brain cell to reach a threshold where it actually fires and relays the message down to others. Potassium and Sodium are exchanged and it helps propagate the message down the brain cell. This is called the depolarization of the cell.

When your brain goes through the acceleration and deceleration injury we discussed previously because of the white matter being stretched, the depolarization increases exponentially as though those nerves were over-stimulated which literally creates an electrical storm in the brain. This is called the excitation phase of the injury.



Mechanism of Concussions

3



During the excitation phase where the depolarization is happening by the millions causing that electrical storm, there is a lot of energy being used up. Energy in this case is ATP, or the molecule of energy in our body that has to be produced by cells. Like we all know, energy cannot just be created from thin air. Your body is using other molecules to make up all of this ATP that it needs to weather the electrical storm. This leads to a bit of an energy crisis because there isn't enough ATP, or energy, to go around. This is very much a metabolic problem and can often be treated by making some dietary changes in the early parts of the concussion.

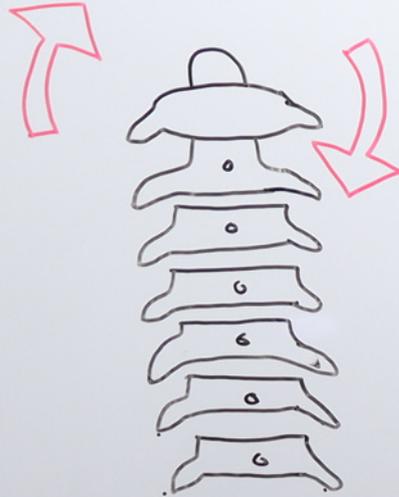
As this happens, people experience increasing fatigue - they will feel tired, lethargic and sleepy all the time. That is just your brain decreasing its functions so that it can manage its use of the energy that it has available. This immediate drop in energy will typically last 5 to 7 days and then your brain will slowly start to regain its energy production abilities and your fatigue may start to settle. If it doesn't, then you still have a metabolic problem and it needs to be addressed as soon as possible. Overall, this phase can last up to a month (or anywhere from 22 to 45 days) and is called the Spreading Depression Phase.



Mechanism of Concussions

4

Concussion occurs at 70 G's
versus
Whiplash occurs at 4.5 G's



This can also be associated with other symptoms like headaches, nausea, dizziness, speech pathologies and other nerve type symptoms that are either functionally happening because of the concussion or structurally due to stress on the joints & tissues in the upper neck.

Did you know, that it is unlikely that you will ever experience a concussion without an upper neck involvement?

It takes 70 Gs of force to cause a concussion whereas it only takes 4.5 Gs to cause a whiplash to the neck? Often neurological symptoms that happen after a concussion are very similar to symptoms from the upper neck and are often missed and not treated. One common presentation is a rotation of your 1st and 2nd vertebrae in the neck. These are really high up, just under the base of the skull, and once they are misaligned can continue to mimic the neurological symptoms of a concussion. If ignored, they only progress and get worse over the time.



Post-Concussion Syndrome

60 to 70% of people will naturally regain function and improve with minimal rehab within the first month or month and a half. However, that leaves the 30 to 40% of people who will not recover and will have persistent symptoms. This is called The Post Concussion Syndrome.

There are 5 primary contributors to this condition.

- 1) Dysregulation of the Autonomic Nervous System and altered blood flow
- 2) Metabolic, Inflammatory & Hormonal Processes
- 3) Visual & Vestibular Dysfunction
- 4) Cervical Spine Dysfunction
- 5) Psychological

If you have persistent post-concussion symptoms and all you have been told to do is rest and take medications with minimal exercises then you need to go through a more thorough assessment to see how you can start making changes to one or all of these areas that are contributing to your on-going symptoms.

Generally speaking, there is no evidence of prolonged rest beyond the first 3 days of a concussion anymore. In fact, more and more research is showing how aerobic exercises improve brain function by improving cortical connectivity, blood flow, autonomic regulation, cognitive function and brain healing modulators.

The question is simply what should you prioritize and do first. The recommendations are different for each individual depending on whether you have just had a concussion or if you have been suffering with persisting symptoms for years.

We are happy to help!

Simply call us at (613) 809-6386 or send an email to info@kanatachiropractor.com and one of our team members will get you scheduled for an assessment.

