

WHAT YOU NEED TO KNOW ABOUT POST-CONCUSSION SYNDROME

Neurohealth Services offers cutting-edge treatment for post-concussion syndrome. Find out how our patients are finding significant relief from ongoing concussion symptoms without invasive treatment or medication.

Inside this report, you'll learn:

- The hidden causes of post-concussion syndrome (PCS) and traumatic brain injury (TBI)
- Actions you can start doing today to get on the path to recovery
- The reason many of the treatments you've tried might not be working
- The reason doctors have a difficult time diagnosing PCS
- How to promote healing from PCS and TBI naturally and safely

Thank you for downloading this free report. If you are suffering from a concussion, we want to help you discover how to avoid suffering from this condition any longer than you have to.

POST-CONCUSSION SYNDROME

PCS is a disabling condition with symptoms that include dizziness, blurred vision, insomnia, headaches, brain fog, mood swings, and more. It's critical to find out what is really happening in order to take the appropriate treatment measures and get you back to your daily routines.

Many people don't realize that if not properly treated, concussion symptoms can persist and worsen. You may have been referred to a neurologist who told

you a concussion can take six months or longer to heal. At Neurohealth Services, we take a proactive approach to “retrain the brain” in order to promote faster healing.

You see, the important distinction is that there are no medical tests for concussions. CT/MRI scans show the structure of the brain and results can still be inconclusive. In order to identify the reason your struggling with daily activities, we have to evaluate how the brain functions.

CONCUSSIONS ARE SOFTWARE PROBLEMS, NOT HARDWARE PROBLEMS

PCS is a tricky condition. When you suffer a concussion, different structures or “networks” in the brain are injured. The result often causes inefficient eye movement, balance, and reaction time. Everything that you do requires more effort than it did before, leading to increased fatigue. You might have found that you’re only able to read for 15 minutes before feeling exhausted. Pushing past exhaustion can lead to increased stress or the brain, perpetuating the problem, and further slowing your recovery.

The key to recovery: understanding the science of neuroplasticity

The main problem with the treatments most doctors prescribe for PCS is that they focus on treating the symptoms rather than addressing the root cause. When the medication wears off, the symptoms are still there.

For example, many patients are given the newest migraine medications on the market like Imitrex or Treximet to treat their headaches. However, most of these patients are not having migraines, they are having post-traumatic headaches. The underlying neurological cause of the headache must be treated. Some doctors will prescribe anti-depressants like Trazadone or Amitriptyline, which may help with sleep, but again, the reality is that they aren’t treating the root cause of the problem.

1. Post-concussion symptoms have many underlying metabolic, psycho-social, and neurologic influences. Simply put, your symptoms are not the best way to determine the overall status of your nervous system. Different environments may cause more stress. For example, symptoms worsen when you're hungry, tired, or stressed.
2. Many of the symptoms that patients experience in Post-concussion syndrome are related to how and where the injury occurred in the brain. Many of the symptoms that patients complain about after a concussion relate directly to the area of the brain that was injured. There are five distinct networks in the brain that generally are affected by brain injury. Understanding which networks are injured is critical to treating the injury.

Understanding how brain injury impacts function

Injuries to the brain generally affect the neurons of the brain at a cellular level. That's why 95% of brain scans appear normal after a concussion. Most injuries affect the brain by way of rotational or torsional forces that result in a twisting effect on the brain. As a result, the injury can affect the brain in very individualized ways. However, our team at Neurohealth Services can localize the source of the symptoms patients are experiencing by understanding which network has been injured. Let's focus on the following five networks and the symptoms that occur when they are compromised:

1. **Prefrontal Cortex.** Symptoms include poor motivation, fatigue, multi-tasking issues, lack of mental clarity, brain fog, emotional lability, hypersexuality, poor executive function, and lack of concentration are common when this network is affected.
2. **Temporal Lobe.** Symptoms include stress, anger, paranoia, hearing changes, seizures, abnormal smells or tastes, memory issues, seizures, and hallucinations.
3. **Brain stem.** Symptoms sensitivity to light and sound, sleep disturbances, startling easily, pain, dizziness, headaches or migraines, anxiety, autonomic and digestive disturbances.

4. **Vestibular System.** Symptoms include dizziness, vertigo, motion sickness, sudden feelings of anxiety. Symptoms can worsen while driving.
5. **Cerebellum.** Symptoms include balance problems, coordination difficulties, tremors, slurred speech, blurred vision, headaches, neck and back pain, and clumsiness.

It's important to remember, more than one network could be affected, and this is often the case. Again, we must identify the root cause of your symptoms in order to effectively treat them. For example, we see patients who have tried a number of different treatments ranging from acupuncture, craniosacral therapy, vestibular rehabilitation. These can be effective therapies, but only if they are targeting the appropriate networks.

Targeting the injured functional network with specific treatment at the optimal frequency, timing, intensity and duration makes a world of difference in the success rate of the therapy.

So you may be asking, how do you know specifically what's causing MY problem? That's a great question and honestly, there are no cookie-cutter approaches to dealing with Post-Concussion syndrome. Every person has their own unique physiology, so the same measures are not effective for every patient. How do we figure out what specifically is going on with each individual patient?

Concussions cause specific neurologic changes that can be measured and compared against normal function. These measurements are called biomarkers.

The latest research into concussions has focused on biomarkers, or identifiers used to objectively track and measures specific functions in the brain that point to abnormalities. They also help us quantify the severity of the problem that you are having. This is so important because again, many patients go to the doctor and their exam looks "normal." Again, it is medically normal, but can be functionally very abnormal.

We know this may come as a shock to you, but imagine this: If the REAL cause of your post-concussion symptoms were to be found to be treatable and permanently eliminated...then yes, your post-concussion syndrome would disappear.

Imagine how your dramatically your life could change after determining that your symptoms are treatable and can be permanently eliminated, allowing you to return to your daily routines, workouts, and social life.

My name is Dr. Brad Ralston, Clinic Director of NeuroHealth Services. I've spent years helping patients who suffered a traumatic brain injury discover the root cause of their problem, eliminate their symptoms and return to function.

In fact, since we've been helping people just like you eliminate their concussion side-effects, we've focused a majority of our practice and skills at helping patients with neurological conditions.

There is really nothing more pleasing than helping people just like you finally able to sleep through the night, energized during the day and living life on their own terms once again.

That's why we offered you this FREE report. We want you to know about cutting edge treatments we offer. Because we know that chances are great that we can eliminate the effects from your concussion.

We've developed our NeuroReset Evaluation that can evaluate your specific biomarkers and help us identify the cause of your symptoms in about 45 minutes.

Our NeuroReset Evaluation is a series of quick and painless tests that help determine:

1. What networks in your brain are affected?
2. How is your brain functioning in terms of biomarkers?
3. How do these functional deficits relate to the symptoms that you are experiencing?

What causes post-concussion syndrome?

The most common functional deficits in PCS are:

- 1. Oculomotor dysfunction:** problems with fixation, pursuits, and saccades are direct indicators of functional deficit in the area that generates each specific eye movement. These eye movements help us localize the problem areas in your brain. In addition, dysfunctional eye movements cause difficulty with things like busy backgrounds, driving, reading, computer work, and schoolwork.
- 2. Balance dysfunction:** problems with the vestibular system and balance centers causes problems with head-eye motion and stability. Many patients experience lightheadedness, vertigo, motion sensitivity or sickness, or disorientation. Dysfunction here can also affect eye movements that involve turning the head and neck.
- 3. Reaction time:** problems with fatigue, multi-tasking, comprehension, motor and coordination. When measured, concussion patients have a slower reaction time than uninjured subjects.
- 4. Autonomic nervous system dysfunction:** insomnia, light and sound sensitivity, brain fog, cold hands and feet. These issues are caused by an over-firing of the upper brainstem (also known as the mesencephalic reticular activation system). There are three parts to the brainstem: upper, middle, and lower. NORMALLY, the brain fires impulses down to the lower two-thirds of the brainstem, and this lower portion slows down the upper brainstem. When there is a loss of the impulse-firing to the lower brainstem because of the concussion, the upper brainstem will over-fire and the result is a constellation of symptoms.

Evaluation of these functions is such a crucial part of getting to the root of your problem. Once we identify what's wrong, we do a deeper dive to find out what's driving it, which could be blood sugar, hormones, inflammation, or cortisol. More on that later!

Overview of the NeuroReset Evaluation

COMPREHENSIVE NEUROLOGIC EXAMINATION

- Vital signs, height, weight, bilateral blood pressure, pulse oximetry
- Comprehensive review of previous medical records, labs, and imaging
- Detailed chronological history of current symptoms
- Medical history including medications and previous injuries
- Review of symptoms and diet
- Complete functional neurologic examination
- Recommendations for any further testing, labwork, or interventions

We also complete an evaluation of biomarkers through the following diagnostics:

DYNAMIC POSTUROGRAPHY

This is a test of static and dynamic balance measured by standing on a both a flat and foam surface d on a flat surface, with eyes open and closed. This evaluates your ability to know where you are in space by testing your proprioception, vestibular and visual systems. Problems in your vestibular or cerebellar systems as well as your neck can be detected by this test. It is the gold standard test in regards to balance function.

REACTION TIME TESTING

This test measures your reaction time speed on a large light board. It's a little like the old Whack-a-Mole game. Delayed reaction time is an important indicator of brain injury or neurodegeneration. This test also evaluates hand-eye coordination, visual processing, memory, and dual tasking.

INTERACTIVE METRONOME

This test evaluates your ability to clap on beat. This looks at your motor-timing and sequencing skills, another deficit seen with concussion and brain injury. By improving this score, you help the networks on each side of your brain align. This device also improves attention, impulse control, executive function, and coordination.

REFLEX TESTING

This test involves your pupillary light response (PLR), which enables us to evaluate the balance between your sympathetic, or fight-or-flight nervous system parasympathetic, or rest-and-digest nervous system. Concussion puts your brain in fight-or-flight mode, which causes symptoms such as light sensitivity, insomnia, and anxiety.

OCULAR TRACKING

Our Right Eye technology allows us to track your eye movements while you follow a moving dot on a computer screen. It allows us to see how your eyes track, jump from target to target, fixate, and move in and out. Ocular tracking is one of the most important functions to measure in a concussion because it not only correlates to your symptoms but also the network in the brain causing your symptoms.

There is nothing more rewarding to us than helping people finally become symptom-free. If you have ongoing symptoms that are disrupting your daily routines weeks or months after a concussion, please schedule a NeuroReset evaluation with Neurohealth Services for just \$89. If you have any questions, give us a call at (317) 848-6000. We'll address your concerns or answer any questions you have about your condition.

Congratulations on taking responsibility for your own welfare. We look forward to helping you, just as we have helped many others.

Sincerely,

Dr. Brad Ralston

Doctor of Chiropractic

Board Certified Chiropractic Neurologist

Fellow of the American Board of Brain Injury and Rehabilitation