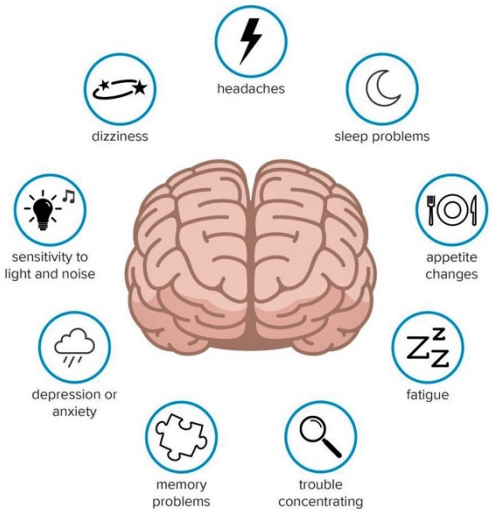
Concussion Protocol

A concussion is a minor traumatic brain injury (TBI) that affects the function and structure of the brain. The functional abnormalities cause symptoms such as memory and attention impairment, headache, and alteration of mental status. After a concussion, there are tissue changes within the brain due to the direct trauma as well as from cerebral blood flow changes which can lead to secondary ischemic injury. There are three main types of concussions. These include focal (brain injury is located where the brain was hit), linear (brain injury when there is no direct contact such as in whiplash), and the most severe, rotational (results from a sudden head twist that temporarily separates the brain stem and spinal cord).

A focal concussion is the most common in which there is a sudden direct blow or bump to the head. There are a few common physical, mental, and emotional symptoms an individual may display following a concussion, including confusion, clumsiness, slurred speech, nausea, headache, sensitivity to light/noise, concentration difficulties, and memory loss. The level at which these symptoms occur is based on how severe the concussion is. Concussions are graded as mild, moderate, or severe. In a mild concussion, symptoms last for less than 15 minutes and there is no loss of consciousness. In a moderate concussion, there is no loss of consciousness but symptoms last longer than 15 minutes. In a severe concussion, there is a loss of consciousness. Secondary injuries that appear several hours or days after the trauma are critical to monitor as these secondary tissue damages are frequently the origin of significant long-term effects, including brain damage, cognitive deficits, and behavioral/emotional changes.



During a concussion, the brain, which is made of soft tissue, is moved rapidly back and forth causing the brain to bounce inside the skull, stretching and damaging the delicate cells and structures inside of the brain. Secondary injuries which are activated in the brain due to the concussion, cause a production of harmful chemicals like free radicals, inflammation, impaired transport of molecules within nerve cells, and imbalances of key ions needed for nerve function.[2] Different parts of the brain can move at different speeds, which produces shearing forces that can stretch and tear nerve tissue. This mechanical insult initiates a complex cascade of metabolic events that leads to neuronal homeostatic imbalances.[1] In a healthy brain, the brain cells maintain a balance of salts and electrolytes inside and outside of the cell with the consumption of energy. When the brain becomes damaged such as in a concussion, the membrane of the cell leaks in potassium while sodium leaks out. This causes the cell to utilize more energy than normal and the effect is the brain cells deplete its energy and do not work properly in that particular region.[3] Brain trauma also causes a release of toxic excitatory neurotransmitters such as glutamate which results in further brain cell injury and dysfunction.[3] Blood flow to the site of injury is also reduced, which hinders the delivery of oxygen and nutrients needed for recovery.[2]

Lipid metabolism is of particular importance for the CNS, as it has a high concentration of lipids, second only to adipose tissue. Altered lipid metabolism is also believed to be a key event which contributes to CNS injury. There are eight types of lipids, one being phospholipids such as phosphatidylcholine, phosphatidylethanolamine, phosphatidylserine and phosphatidylinositol. Phospholipids are important components of all mammalian cells and have a variety of biological functions including formation of lipid bilayers of cell membranes; function as an energy reservoir (for example, triglycerides); and serve as precursors for various second messengers, such as arachidonic acid (ArAc), docosahexaenoic acid (DHA), ceramide, 1,2-diacylglycerol (DAG), phosphatidic acid and lyso-phosphatidic acid.

'Oxidative stress' occurs with increased levels of free radicals or reactive oxygen species (ROS) when blood flow is reduced and cells don't have enough capacity to detoxify them due to a TBI. ROS then cause oxidative damage to nucleic acids, proteins, carbohydrates and lipids. ROS can attack the unsaturated fatty acids (PUFAs) in the

phospholipids and cause lipid peroxidation which is very damaging to the cell membrane as well as the entire cell structure. Such deregulated lipid metabolism is believed to be associated with not only TBI but also in many neurological disorders including Alzheimer's disease, Parkinson's disease, multiple sclerosis, Huntington's disease, amyotrophic lateral sclerosis, schizophrenia, bipolar disorders, epilepsy, and stroke. [6]

Microglia, which have a variety of functions in the brain, become rapidly active in response to a TBI. Early microglial activation is beneficial as it may contribute to the restoration of homeostasis in the brain. Unfortunately, if they remain chronically activated, microglia display a classically activated phenotype and release pro-inflammatory molecules and reactive oxygen species, resulting in further tissue damage and potentially neurodegeneration.[5] This chronic inflammation can lead to scar tissue formation within certain brain structures.

Individuals who have suffered repeated concussions and brain injuries, such as sports players, are at risk of developing chronic traumatic encephalopathy (CTE) which is a neurodegenerative disease that can cause progressive cognitive decline and behavioral and emotional problems several years after the injuries. Many retired American football players have been shown to suffer from CTE. Symptoms of CTE include memory loss, depression, anxiety, headaches, and sleep disturbances that often gets worse over time and can result in dementia. CTE has also led to player deaths.[4] According to the Boston University CTE Center, CTE is found in athletes, military veterans, and others with a history of repetitive brain trauma.[4]

The pathophysiology of CTE is a result of damage to the axons due to repetitive traumatic injury and neurodegeneration of the affected brain tissues. The concept of immunoexcitotoxicity has been proposed as a possible mechanism for CTE. A cascade of events begins with an initial head trauma, which "primes" the microglia for subsequent injuries. When the homeostasis of the brain is disturbed, some of the microglia undergo changes to set them in a partially activated state. When these microglia become fully activated by continued head trauma, they release toxic levels of cytokines, chemokines, immune mediators, and excitotoxins like glutamate, aspartate, and quinolinic acid. These excitotoxins inhibit phosphatases, which results in hyperphosphorylated tau protein and eventually neurotubule dysfunction and deposition of neurofibrillary tangles (NFTs) in particular areas of the brain.[9]

Damaged blood vessels and vasculitis within the brain could also trigger brain inflammation and, eventually, the development of proteins such as Tau, which clump and slowly spread throughout the brain in CTE. [4]

The microglia cell can also remain primed from insults to the brain from infections in the brain, environmental toxins, and latent viral infections in the brain such as cytomegalovirus and herpes simplex virus.[10] A number of studies have linked the risk of Alzheimer's disease (AD) to latent viral infections in the brain. For example, the herpes simplex virus is strongly linked to AD risk.[10] It may be that those at greatest risk of CTE following repetitive trauma are those with a combination of such risk factors.

Wellness Recommendation

The wellness recommendation for a concussion depends on the severity. For an early-stage or mild concussion, Brown and LC Balancer are recommended to shorten the recovery time. Brown helps to facilitate prompt recovery by enhancing lipid metabolism to help repair the damaged cell membrane and reduce oxidative stress to reduce brain inflammation. Lycium barbarum, an herb in Brown, has many benefits on liver health. This herb has been shown to alleviate oxidative stress to prevent free radicals as well as regulates lipid metabolism of the liver to support phospholipids synthesis. [7] This duel action helps to shorten the recovery time after a TBI, such as a concussion. LC Balancer helps assist injury healing through enhancing microcirculation to increase nutrient absorption and delivery to the injured area and supports the kidneys to expel the metabolic waste. Patients can experience symptom reduction in three days and 1-3 weeks of treatment is recommended for significant results.

For a severe concussion and CTE, the wellness recommendation also includes Platinum, Resurgin, Surgenin, and Glia. Platinum helps to reduce brain inflammation through clearing chemokines and returning activated microglia to the baseline to slow the release of pro-inflammatory molecules. Herbal ingredients in Platinum have been shown to have strong anti-inflammatory effects and down-regulates inflammatory cytokines such as TNF-alpha and nitric oxide.[8] Resurgin and Surgenin are utilized to reduce brain blood vessel inflammation and clear any blockage to help

resume blood flow. Through resuming blood flow to the site of injury, the necessary nutrients needed for repair can be restored. Glia helps to reduce brain glia cell inflammation and enhance the brain's glymphatic circulation to remove the excessive metabolic wastes from the brain. Reducing glial cell inflammation and can help to clear the over-activated microglia that are producing inflammatory cytokines. Following Glia, Gliagen may be necessary to repair brain glial cells. Patients can experience symptom reduction in 1 week, and 3-6 weeks of treatment is recommended for significant results.

If patients are experiencing secondary injuries following a past concussion with symptoms of migraines, speech difficulty due to chronic inflammation, and brain scar tissue formation, Gold, Qi Booster, Brown, LC Balancer, and Xcel are recommended. Gold and Qi Booster work together to help remove scar tissue in the brain. Brown, LC Balancer, and Xcel assist the body in toxin removal. If patients are experiencing behavioral and emotional changes such as depression, Lifegen, Blood Tonic, and Clever are also recommended. Lifegen and Blood Tonic help to resume neurotransmitter production through improving blood flow to the limbic system. This helps neurotransmitter levels back to homeostasis and helps to combat symptoms of depression following a concussion. Clever helps to restore the connection between neurons that had become damaged during the TBI. Patients can experience symptom reduction in 1 week, and 3-6 weeks of treatment is recommended for significant results.

If patients also have fluid retention and blood clots in the brain caused by blood vessel injury with symptoms of headache, insomnia or hearing loss, Sona-R is recommended to resolve the brain blood stagnation and dissolve the blood clots. Peach-R is recommended to help enhance brain meridian Qi to help heal the brain blood vessel damage and resolve headaches, insomnia, and post-concussion syndrome. Deer is recommended to help repair the neuron damage to help improve memory. Clever is recommended to help restore the neuron connection and improve cognitive function. Patients can experience symptom reduction in 1 week, and 3-6 weeks of treatment is recommended for significant results.

If patients also have latent viral or other types of slow growth microorganisms in the brain, other germ removal formulas are also required. Brainin is recommended to help remove mycobacteria in the brain and clear symptoms of partial or focal seizure and uncontrollable muscle contractions. P-2 is recommended to help remove gram-negative bacteria in the brain and clear symptoms of muscle spasm, headache, and psychiatric problems. P-F is recommended to help remove fungus in the brain and clear symptoms of headache, dizziness, and impaired brain function. If these formulas can't resolve all the symptoms, second-line formulas are recommended. Brainin-2 is recommended to help remove mycobacteria in the brain and clear symptoms of brain fog and cognitive difficulty. Cerebrin is recommended to help remove gram-negative bacteria in the brain and clear symptoms of muscle spasm, facial droop, headache, and psychiatric problems. Almond is recommended to help remove latent virus in the brain and improve memory and cognitive function.

Following the germ removal, if patients still experience headache, insomnia, poor memory, and muscle spasm and tightness in the arms, legs, and trunk, BetterNow and B-3 are recommended to resolve the brain deficiencies that cause these symptoms. BetterNow nurtures the Qi and Blood of the brain to improve memory and resolve insomnia. B-3 helps clear the phlegm damp in the brain. The phlegm damp in the brain can cause the lymph in the brain to become less soluble and the microglia cell cannot process it. B-3 helps remove the phlegm damp and improve the solubility of the lymph in the brain and enhances the lymph recycling to resolve the symptoms of headache, muscle tightness, and spasms.

Product Summary

	Products	Description
Mild/Early Stage Concussion	Brown, LC Balancer	Helps to facilitate prompt recovery through enhancing lipid metabolism
Severe Concussion	Platinum, Resurgin, Surgenin, Glia, Brown, LC Balancer	Reduces brain and glial cell inflammation Improves brain blood vessel flow
Secondary Injuries - Migraines	Gold, Qi Booster, Brown, LC Balancer, Xcel	Removes scarring in the brain from chronic inflammation
Secondary Injuries – Behavioral/Emotional Changes	Lifegen, Blood Tonic, Clever, Gold, Qi Booster, Brown, LC Balancer, Xcel	Improves blood flow to the limbic system Restores connections between neurons
Brain Fluid Retention & Blood Clots	Sona-R, Peach-R, Deer, Clever	Removes brain blood stagnation Heals blood vessel damage Repairs and restores neurons
Latent Viral Infection/Slow Growth Microorganisms in Brain	First Line: Brainin, P-2, P-F Second Line: Brainin-2, Cerebrin, Almond	Removes mycobacteria, gram-negative bacteria, fungal infections in the brain
Post-Germ Removal Symptoms	BetterNow, B-3	Nurtures Qi and Blood in the brain Enhances lymph recycling

Selected Case Study

Case: Concussion and Musculoskeletal Injuries Improvement

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A 66-year-old female patient experienced a head injury with concussion as well as body injuries to her low back, right hip, left foot/ankle and left wrist while defending herself against a carjacking attempt. No prescription medications were taken however the patient used over-the-counter pain medications, sleep aids and some CBD (with and without THC) in order to manage her post injury symptoms. The patient utilized these for approximately 8 months. The daily life interferences in addition to pain included sleep disturbance, headaches, poor concentration and mood swings.

The patient sought care in April 2021. The initial care plan included Chinese herbal formulas from Wei Lab to address breathing difficulties, upper respiratory distress and Post-Concussion Syndrome. Care formulas included Golden Flower Tea, and Silver Formula. Corrective care formulas included Brown Formula and LC Balancer. In-clinic care included chiropractic adjustments of cranium, spine and extremities, Transcranial Photo Bio Modulation, custom functional orthotics, Wei Lab herbal FASTT and WHITEE Patches. The patient has also been put on home sleep monitoring to track oxygen levels. The patient's main goal is recovery of stability, standing and walking, and brain functions, all of which have been complicated, pain and difficulty sleeping.

The patient has improved in all areas (85% overall). She was able to improve (50%) from the primary concussion symptoms with herbal protocols through virtual guidance in approx. 6 months. In terms of the body injuries, with Patches and chiropractic care, the improvement was achieved in approx. 6 weeks.

In terms of respiratory fitness and residual sleep disorder, we are currently going into the 2nd month back to home-based care with continued progress. The patient has resumed moderate exercise and advanced nutrition (amino acid-based formulations).

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