

## Concussion and Traumatic Brain Injury (TBI) Nutritional Considerations

**Research has revealed that following brain injury, a wide range of changes occur in both the brain and body – these include changes in nutritional status.**

### Which nutraceuticals may help?

- **Vitamins** are nutrients required for normal function of our everyday physiology (2).
  - **Vitamin B2** (Riboflavin): found in eggs, lean meat, low-fat milk and green vegetables (3)
  - **Vitamin B3** (Niacin): found in meat, fish, soy and mushrooms (4)
  - **Vitamin C**: found in citrus fruits and vegetables (5)
  - **Vitamin D**: found in fatty fish and generated by exposure to sunlight (6)
  - **Vitamin E**: found in nuts, seeds, and vegetable oils (7)

Research reveals Vitamins B2, B3, C, D, and E may have a role in the treatment of concussion symptoms, either alone or in conjunction with other supplements or pharmacological treatments.

- **Flavonoids**, such as **resveratrol**, are antioxidants found in fruits, vegetables, and teas (2). Antioxidants have anti-inflammatory properties, and animal studies have shown they can reduce brain inflammation following TBI (10).
- **Omega 3 Fatty Acids (O3FA)** are found in foods such as fish and flaxseed, and some dietary supplements (ex. fish oil) (11). Animal research shows supplementing with O3FA prior to concussion helps to prevent concussion and the neurobehavioral/cognitive effects that may follow brain injury (2; 10).
- **Curcumin**, a phytochemical found in the spice turmeric, may assist in improving balance and reducing neuroinflammation (or swelling in the brain) (8).
- **Melatonin**, a hormone that we naturally produce and is implicated in our sleep-wake cycle, may also have a neuroprotective role in TBI (8). Specifically, melatonin may reduce swelling in the brain, as well as improve cognition and neurological function (8; 10).
- **Creatine**, a supplement most commonly taken by weight-lifters to increase muscle mass, may also have neuroprotective effects that aid in TBI treatment. Currently, creatine has been studied in two human-based studies in children with moderate-severe brain injury. The results indicated that children who were given creatine supplements had a significant improvement in cognition, behavior, communication, personality, and self-care, as well as a significant decrease in fatigue, headaches, and dizziness (8).
- **Coenzyme Q10** is a naturally occurring antioxidant in the human body (12). Administration of coenzyme Q10 following TBI has had a positive effect on animal brain recovery – reducing neurodegeneration (the death of brain cells) and increasing blood supply to the brain (13).
- **Magnesium**, a mineral found in the human body, as well as in high-fiber foods (i.e. green vegetables), is also suggested to play a critical role in brain health (2; 14). Specifically, studies in animals have revealed that magnesium therapy promotes functional recovery from TBI. On the other hand, low levels of dietary magnesium may lead to poorer outcomes (2).

\* As Concussion is less “structural” damage than it is “neuro-metabolic cascade”, taking quick action on properly applied nutritional modification and supplementation can be a tremendous game changer in how quickly as well as how completely a person heals from Concussion/ Traumatic Brain Injury (TBI).

SUPPLEMENTATION with some of these Nutraceuticals can be KEY in both Post-Concussive treatment as well as proactively to assist in preventing the severity of concussion. It is safer to assume that with impact sports in particular, that some level of concussion is fairly imminent. Therefore, taking proactive action steps are imperative.

\*Make sure to discuss appropriate Nutrition and Supplementation with your Healthcare Provider!