

# Support for Healthy Neurovascular Function

Developed and reviewed by the clinical, chiropractic, and naturopathic members of the Standard Process team

## Neurovascular Physiology

The neurovascular system encompasses a complex network of blood vessels that supply the brain with oxygen, glucose, and other nutrients while also removing metabolic waste products. The neurovascular system is a selective filter between blood and neural tissue. This blood-brain barrier allows nutrients to pass into brain tissue while protecting it from pathogens, inflammation, toxins, and disease.

While cerebrospinal fluid (CSF) is not part of the neurovascular system per se, it is closely related. CSF is derived from the blood and travels in the perivascular spaces to deliver essential nutrients to the brain. CSF provides immunological protection to the brain and lymphatic clearance of toxins and metabolites. The flow of CSF is closely tied to the arterial pulse wave and respiration.

The neurovascular system can be negatively impacted by systemic inflammation, the aging process, vasoactive medications, increased blood viscosity, and injury to the central nervous system. A compromised neurovascular system is associated with neurodegenerative and neuroinflammatory processes.

Lifestyle and nutrition interventions can support healthy circulation, vascular integrity, brain-barrier function, and healthy CSF flow and function.

## Supportive Lifestyle Practices

- Encourage regular exercise which has been found to induce angiogenesis and increase cerebral blood volume to promote brain oxygenation.<sup>1</sup>
- Promote good sleep habits. Quality sleep supports proper cerebrospinal fluid and nervous system lymphatic function; the highest clearance of metabolites from the brain occurs during slow-wave sleep.<sup>2</sup>
- Encourage patients to incorporate stress reduction techniques into their daily lives. Chronically elevated cortisol can lead to arterial stiffening and microvascular damage.<sup>3</sup>

## Whole Foods Nutritional Recommendations

- Encourage patients to consume foods high in nitrates such as beetroot, Swiss Chard, and spinach. Dietary nitrate benefits the vascular system via the nitrate–nitrite–nitric oxide pathway. Nitric oxide supports the vasodilation of blood vessels and promotes the delivery of oxygen and nutrients to tissues in the central nervous system and elsewhere.<sup>4</sup>
- Educate patients on the benefits of consuming foods rich in the omega-3 fatty acids EPA and DHA. These fatty acids support neurovascular health through their modulation of inflammatory, oxidative, and thrombotic processes. They also support a healthy blood-brain barrier, endothelial function, and lipid profile.<sup>5</sup> Calamari, salmon, tuna, and cod liver are all rich sources of EPA and DHA.
- Suggest that patients incorporate buckwheat into their diet. Tartary buckwheat is a good source of flavonoids like rutin and quercetin which are thought to support brain health by modulating neuroinflammatory processes.<sup>6-8</sup>

# Dietary Supplement Regimen



## NeuroRegenex

Suggested Use: **2 tablets three times daily**

MediHerb NeuroRegenex offers a specialized extract of curcumin with FenuMAT™ technology for enhanced bioavailability; along with Boswellia with FenuMAT™, Bupleurum, and Gotu Kola, which is standardized for key constituents. The herbs in NeuroRegenex work to:

- To provide antioxidant activity\*
- To support a healthy inflammatory response\*
- To tonify the brain and support healthy mental clarity, cognition and memory function, as used traditionally in Ayurveda\*
- Rejuvenate and support the body’s natural ability to adapt to temporary stress, as used traditionally in Ayurveda\*



## Cyruta Plus

Suggested Use: **1 tablet per meal**

Cyruta Plus supports capillary integrity and function.\*

- Supports circulatory cholesterol transport\*
- Supports healthy peripheral circulation\*
- Contains several independent factors that help to maintain the integrity of capillary walls\*



## Ginkgo Forte

Suggested Use: **1 tablet one to four times daily**

Ginkgo Forte contains Ginkgo leaf which has traditionally been used in herbal preparations to:

- Support and encourage healthy blood circulation\*
- Support memory and cognition\*
- Promote mental alertness and mental clarity\*
- Provide antioxidant activity to support healthy cell function\*



## Calamari Oil

Suggested Use: **1 teaspoon (5 mL) per day**

Calamari Omega-3 Liquid is a calamari oil supplement that supports brain health and cognitive function and healthy inflammatory processes.\*

## Assessment of Neurovascular Health

## In Office/Physical Exam

- Physical Exam: Vital signs, neurologic assessment, and mental status examination
- Lab Studies: advanced lipid panel, high sensitivity c-reactive protein, comprehensive metabolic panel
- Omega-3 Index Test
- Signs/Symptoms such as headaches, dizziness, transient ischemic attacks, focal neurologic deficits
- Medical History: High blood pressure, metabolic syndrome, diabetes, smoking, cognitive issues, family history of stroke
- Imaging in appropriate patients

### REFERENCES

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