

CLINICALLY TESTED

OPTICNERVE FORMULA[®] SOFTGELS



DESCRIPTION

OpticNerve Formula is a specialized formulation with phytonutrients and fatty acids, designed to help protect the optic nerve. It provides nutrients that quench free radicals and block compounds believed to damage nerve cells, plus nutrients that enhance eye circulation and support vascular function.

OPTICNERVE FORMULA HIGHLIGHTS

- Clinically tested¹ support for optic nerve health in four softgels daily
- Delivers eye-healthy omega-3 fatty acids and key antioxidants including alpha-lipoic acid, vitamins C and E, and coenzyme Q10
- Provides Ginkgo biloba and bilberry anthocyanins to support ocular blood flow, as well as select B vitamins, magnesium, taurine, and flavonoids to promote normal vascular function
- Made in NSF[®]-certified facilities from the finest quality, bioavailable ingredients

OPTIC NERVE HEALTH IS VITAL TO HEALTHY VISION

The optic nerve is a bundle of nerve fibers that connect the retina with the brain. Optic nerve health can be compromised in certain eye disorders. In ischemic optic neuropathy for example, blood supply to the nerve is interrupted, slowing delivery of oxygen and nutrients and causing cell damage or death.

Glaucoma, affecting about 3-4 million Americans, is another example. Glaucoma results in optic nerve damage, often due to increased pressure of fluid between the cornea and lens. In open angle glaucoma, fluid drains too slowly, causing increased pressure and vision loss. However, 15-30% of patients never develop high pressure. For this reason, glaucoma is now viewed as a neurodegenerative disease – caused by damaged or lost nerve cells – and not just a disease of intraocular pressure (IOP). Increasingly, attention is being focused on nutritional influences in optic nerve health.

NEUROPROTECTION AND NUTRITION

In recent years, the focus of glaucoma research has shifted toward neuroprotection, since the disease can progress despite traditional treatment. New strategies are being developed to help protect nerve cells as a complement to IOP-lowering treatments². There is now greater recognition of the role of ocular blood flow, for example^{3,4}. Emerging research highlights the importance of supporting mitochondrial function to protect retinal ganglion cells⁵. Other strategies include blocking damaging nitric oxide radicals, or minimizing release of glutamate – which, in excess, causes cell death. Also targeted is reducing oxidative damage to

the eye's fluid drainage system, which has been linked to higher IOP and visual field loss⁶.

RATIONALE FOR INCLUSION OF KEY INGREDIENTS

Ginkgo biloba Extract (120 mg)

Ginkgo biloba is a source of protective flavonoids and compounds that reduce clumping of blood platelets. Experimentally, Ginkgo biloba scavenges nitric oxide radicals implicated in nerve cell damage, and prevents neurotoxicity from excess glutamate⁷. In preliminary clinical trials, Ginkgo biloba has been found to increase ocular blood flow in healthy people and to improve visual field in those with normal IOP^{8,9}. OpticNerve Formula provides a level of Ginkgo biloba consistent with these findings.

Bilberry (115 mg) and Grapeseed Extracts (50 mg)

Bilberry contains anthocyanins – flavonoids found in dark purple fruits. Anthocyanins accumulate in the retina and other ocular tissues, where they may activate oxidative defense enzymes. They have been clinically shown to reduce markers of inflammation^{10,11}. Procyranidin flavonoids, found in grape seeds and other sources, have been studied in combination with bilberry anthocyanins for ocular hypertension. One study reported improved ocular blood flow as measured by color doppler imaging¹². In another trial¹³, the combination reduced IOP and increased IOP-lowering effects of a common glaucoma drug.

Vitamins C (250 mg), E (20 mg), and CoQ10 (60 mg)

Concentrated in the eye's aqueous humor and in nerve cells, vitamin C helps protect against oxidative stress. Experimentally, vitamin C stimulates production of hyaluronic acid – an important component of the spongy trabecular network that drains fluid from the eye. Low hyaluronic acid and vitamin C levels have been detected in glaucoma¹⁴. Vitamin E helps protect fatty acids in cell membranes from oxidative damage. The vitamin C level in OpticNerve Formula reflects the amount generally found to saturate the eye's aqueous humor. Vitamin E is provided as natural mixed tocopherols, including alpha and gamma forms.

The antioxidant coenzyme Q₁₀ (CoQ₁₀) plays a critical role in generation of energy (ATP) within the mitochondria of all cells. Glaucoma is characterized

by progressive death of retinal ganglion cells. The axons of these cells are rich in mitochondria to meet the high energy requirement for nerve conduction, and the inability of mitochondria to maintain normal function plays a role in ganglion cell death^{5,15}. CoQ₁₀ has shown significant protection of retinal ganglion cells in animal studies¹⁶. CoQ₁₀ has also been reported to afford protection in neurodegenerative diseases, such as Alzheimer's and Parkinson's. CoQ₁₀ is included in this formula at a level shown to increase plasma concentrations¹⁷.

Omega-3 Fatty Acids: DHA (100 mg), EPA (20 mg)

The omega-3 fatty acid, DHA, is a primary component of retinal photoreceptors and the myelin sheath that surrounds nerve fibers. In lab studies, DHA protects retinal nerve cells during oxidative stress. In patients with controlled IOP, DHA has been reported to improve contrast sensitivity (the ability to distinguish between an object and its background)¹⁸. OpticNerve Formula provides DHA as well as EPA, since reduced blood levels of both are seen in glaucoma¹⁹. The DHA level doubles our typical dietary intake.

Folate (667 mcg DFE), B12 (300 mcg), B6 (10 mg)

This B vitamin trio helps maintain healthy blood levels of homocysteine, a compound that can damage blood lipids and small vessels. Elevated homocysteine has been found to raise risk of certain forms of glaucoma, as well as cardiovascular disease and neurodegenerative diseases like Alzheimer's. Evidence suggests those with vascular disease are at increased risk of glaucoma progression²⁰. Levels of B12, needed to form the myelin sheath surrounding optic nerve fibers, are often low in the elderly. OpticNerve Formula provides high potency B12 in a highly bioavailable form. The folate and B6 levels in this product reflect levels clinically shown to reduce elevated homocysteine. As many also obtain folate from a multivitamin and fortified foods, the level is set at the Daily Value to ensure prudent intake from all sources combined

Alpha Lipoic Acid (200 mg) and Taurine (250 mg)

Alpha lipoic acid is involved in the production of metabolic energy. Supplemental alpha lipoic acid has been shown to cross the blood-brain barrier, and to act as a free radical scavenging antioxidant. Experimentally, it has been shown to protect retinal ganglion cells²¹ from





OpticNerve Formula® is a powerful formulation designed to support normal vascular and nerve function, promote ocular blood flow, and increase protective antioxidant intake.

Suggested Use: Take a total of four softgels daily, with meals.

Note: Contains Ginkgo biloba, which may affect platelet aggregation. If you are taking anticoagulant or antiplatelet medication, ask your physician. Pregnant or lactating women or individuals with medical condition should consult their physician before using. Keep out of the reach of children.

These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure or prevent any disease.

Supplement Facts

Serving Size: 4 Softgels

Servings Per Container: 30

	Amount per Serving	% Daily Value
Calories	15	
Total Fat	1 g	1%
Vitamin C (ascorbic acid)	250 mg	278%
Vitamin E (from d-alpha tocopherol, mixed tocopherols)	20 mg	133%
Niacin (from niacinamide)	200 mg NE	1,250%
Vitamin B6 (from pyridoxal 5-phosphate)	6.8 mg	400%
Folate (50% from folic acid, 50% from calcium folinate)	667 mcg DFE	167%
Vitamin B12 (as methylcobalamin)	300 mcg	12,500%
Magnesium (from magnesium oxide, aspartate)	120 mg	29%
Taurine	250 mg	†
Alpha Lipoic Acid	200 mg	†
Ginkgo Leaf Extract (24% ginkgolflavone glycosides)	120 mg	†
Omega-3 Fatty Acids (100 mg DHA, 20 mg EPA, from fish oil)	120 mg	†
Bilberry Fruit Extract (25% anthocyanins)	115 mg	†
Coenzyme Q10 (CoQ10)	60 mg	†
Grape Seed Extract (95% proanthocyanidins)	50 mg	†
Quercetin (as quercetin dihydrate)	50 mg	†

*Percent Daily Values are based on a 2,000 calorie diet.
† Daily Value not established.

Other Ingredients: Flaxseed Oil**, Kosher Bovine Gelatin, Glycerin, Sunflower Lecithin, Water, Beeswax, Lemon Oil, Caramel Color (4-MEI free, from organic sugarcane), and Annatto.

**Provides 460 mg of additional omega-3 fatty acids from flax seed oil.



SCIENCEBASED
HEALTH®
1.888.433.4726
www.SBH.com

Alpha Lipoic Acid (200 mg) and Taurine (250 mg)

(Continued):

glutamate toxicity and nerve tissue from oxidative damage. Clinically, it has been reported to support visual function in those treated with IOP-lowering therapy²².

Taurine, an amino acid concentrated in the eye and found in the optic nerve, may help counter excess levels of nerve-damaging glutamate in the body. An acute dose has been clinically shown to promote blood flow during oxidative stress by restoring vessels' ability to dilate²³. The amount of taurine included is about twice the typical dietary intake – an ample amount to offset age-related declines in retinal levels.

Quercetin (50 mg) and Magnesium (120 mg)

OpticNerve Formula contributes a significant level of flavonoids from a variety of plant sources. A quercetin-rich diet has been shown to improve antioxidant enzyme activity in healthy individuals²⁴. Large population health studies have also found clear associations between quercetin intake and risk of death from coronary heart disease and stroke. Quercetin in this formula exceeds the amount linked to reduced CVD risk.

Magnesium is important for maintaining normal vascular tone. In normal tension glaucoma, chronic migraine patients are at risk for faster progression of the disease. In these patients, nerve damage may be related to vasospasm (spasms of vessels) and, thus, decreased blood supply to the optic nerve. Low magnesium levels may be a factor in migraine, and supplementation has been reported to be of clinical benefit²⁵. This formula provides concentrated and well tolerated sources of magnesium.

REFERENCES

- Harris, Al, et al. The effects of antioxidants on ocular blood flow in patients with glaucoma. *Acta Ophthalmol* 2:237-41, 2018.
- Bessero AC and Clarke P. Neuroprotection for optic nerve disorders. *Cur Opin Neurol* 23:10–15, 2010.
- Weinreb RN and Harris A. Ocular Blood Flow in Glaucoma. Consensus Series 6, World Glaucoma Association. Kugler Publications, 2009.
- Mozaffarieh M, et al. Review. Oxygen and blood flow: players in the pathogenesis of glaucoma. *Molecular Vis* 14:224-33, 2008.
- Cheung W and Cordeiro F. Neuroprotection in glaucoma. *Optom Vis Sci* 85:406-16, 2008.
- Yuan H, et al. Mitochondrial Complex I Defect Induces ROS Release and Degeneration in Trabecular Meshwork Cells of POAG Patients: Protection by Antioxidants. *Invest Ophthalmol Vis Sci* 49:1447–58, 2008.
- Zhu L, et al. Antagonistic effects of extract from leaves of ginkgo biloba on glutamate neurotoxicity. *Zhongguo Yao Li XZue Bao* 18:344-47, 1997.
- Chung HS, et al. Ginkgo biloba extract increases ocular blood flow velocity. *J Ocul Pharmacol Ther* 15:233-40, 1999.
- Quaranta L, et al. Effect of Ginkgo biloba on preexisting visual field damage in normal tension glaucoma. *Ophthalmol* 110:359-62, 2003.
- Karlson A, et al. Anthocyanins inhibit nuclear factor-kB activation in monocytes and reduce plasma concentrations of pro-inflammatory mediators in healthy adults. *J. Nutr.* 137:1951–54, 2007.
- Kelley DS, et al. Consumption of Bing sweet cherries lowers circulating concentrations of inflammation markers in healthy men and women. *J Nutr* 36:981–86, 2006.
- Steigerwald RD, et al. Effects of mirtogenol on ocular blood flow and intraocular hypertension in asymptomatic subjects. *Molecular Vis* 14:1288-92, 2008.
- Steigerwald RD, et al. Mirtogenol potentiates latanoprost in lowering intraocular pressure and improves ocular blood flow in asymptomatic subjects. *Clin Ophthalmol* 4:471-76, 2010.
- Yuki K, et al. Reduced-serum vitamin C and increased uric acid levels in normal-tension glaucoma. *Graefes Arch Clin Exp Ophthalmol* 248:243–48, 2010.
- Russo R, et al. Rational basis for the development of coenzyme Q10 as a neurotherapeutic agent for retinal protection. in Nucci C et al (Eds) *Prog in Brain Res* 173:575-82, 2008.
- Nakashima Y, et al. Coenzyme Q10 protects retinal cells against oxidative stress in vitro and in vivo. *Brain Res* 1226:226-33, 2008.
- Lu, W-L, et al. Total coenzyme Q10 concentrations in Asian men following multiple oral 50-mg doses administered as coenzyme Q10 sustained release tablets or regular tablets. *Biol. Pharm. Bull.* 26:52-55, 2003.
- Cellini M, et al. Fatty acid use in glaucomatous optic neuropathy treatment. *Acta Ophthalmol Scand Suppl* 227:41-42, 1998.
- Ren H, et al. Primary open-angle glaucoma patients have reduced levels of blood docosahexaenoic and eicosapentaenoic acids. *Prostaglandins Leukot Essent Fatty Acids* 74:157-63, 2006.
- Topouzis F, et al. Risk factors for primary open-angle glaucoma and pseudoexfoliative glaucoma in the Thessaloniki eye study. *Am J Ophthalmol* 152:219-28, 2011.
- Osborne N. Pathogenesis of ganglion "cell death" in glaucoma and neuroprotection: focus on ganglion cell axonal mitochondria. In C. Nucci et al (Eds). *Prog in Brain Res* 173:339-52, 2008.
- Filina AA, et al. Lipoic acid as a means of metabolic therapy of open-angle glaucoma. *Vestn Oftalmol* 111:6-8, 1995.
- Fennessy FM, et al. Taurine and vitamin C modify monocyte and endothelial dysfunction in young smokers. *Circulation* 107:410-15, 2003.
- Hwa-Young K, et al. Effects of phenol-depleted and phenol-rich diets on blood markers of oxidative stress, and urinary excretion of quercetin and kaempferol in healthy volunteers. *J Am Coll Nutr* 22:217-33, 2003.
- Peikert A, et al. Prophylaxis of migraine with oral magnesium: results from a prospective, multi-center placebo-controlled and double-blind randomized study *Cephalalgia* 16:257-63, 1996.

