

# Optic Nerve Formula<sup>®</sup> SoftGels

## Description

Optic Nerve 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.

## Optic Nerve Formula Highlights

- ▶ Targeted 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, n-acetyl cysteine and coenzyme Q<sub>10</sub>
- ▶ 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<sup>®</sup>-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 treatments<sup>1</sup>.

There is now greater recognition of the role of ocular blood flow, for example<sup>2,3</sup>. Emerging research highlights the importance of supporting mitochondrial function to protect retinal ganglion cells<sup>4</sup>. 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 loss<sup>5</sup>.

## 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 glutamate<sup>6</sup>. 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<sup>7,8</sup>. Optic Nerve 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<sup>9,10</sup>. Procyanidin 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 imaging<sup>11</sup>. In another trial<sup>12</sup>, the combination reduced IOP and increased IOP-lowering effects of a common glaucoma drug.

### Vitamins C (250 mg), E (30 IU), and CoQ<sub>10</sub> (50 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 glaucoma<sup>13</sup>. Vitamin E helps protect fatty acids in cell membranes from oxidative damage. The vitamin C level in Optic Nerve 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 Q<sub>10</sub> (CoQ<sub>10</sub>) 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<sup>4,14</sup>. CoQ<sub>10</sub> has shown significant protection of retinal ganglion cells in animal studies<sup>15</sup>. CoQ<sub>10</sub> has also been reported to afford protection in neurodegenerative diseases, such as Alzheimer's and Parkinson's. CoQ<sub>10</sub> is included in this formula at a level shown to increase plasma concentrations<sup>16</sup>.

### 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)<sup>17</sup>. Optic Nerve Formula provides DHA as well as EPA, since reduced blood levels of both are seen in glaucoma<sup>18</sup>. The DHA level doubles our typical dietary intake.

### Folate (400 mcg), 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





**Optic Nerve 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	
Calories from Fat	15	
Total Fat	1 g	2%
Vitamin C (ascorbic acid)	250 mg	417%
Vitamin E (from d-alpha tocopherol, mixed tocopherols)	30 IU	100%
Vitamin B6 (from pyridoxine hydrochloride)	10 mg	500%
Folate (50% from folic acid, 50% from calcium folinate)	400 mcg	100%
Vitamin B12 (as methylcobalamin)	300 mcg	5000%
Magnesium (from magnesium oxide, aspartate)	120 mg	30%
Taurine	250 mg	†
N-Acetylcysteine (NAC)	300 mg	†
Alpha Lipoic Acid	200 mg	†
Ginkgo Biloba Extract (leaf) (24% ginkgolactone glycosides)	120 mg	†
Omega-3 Fatty Acids (100 mg DHA, 20 mg EPA from USP <sup>®</sup> -verified fish oil)	120 mg	†
Bilberry Fruit Extract (25% anthocyanins)	115 mg	†
Coenzyme Q10 (CoQ10)	50 mg	†
Grape Seed Extract (95% proanthocyanidins)	50 mg	†
Quercetin	50 mg	†

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

**Other Ingredients:** Flax Seed Oil\*\*, Gelatin, Glycerin, Beeswax, Water, Lecithin, Caramel Color, Titanium Dioxide and Lemon Oil Flavoring.  
Contains lecithin made from soybeans.



## Folate, B12 and B6 (Continued)

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 progression<sup>19</sup>. Levels of B12, needed to form the myelin sheath surrounding optic nerve fibers, are often low in the elderly. Optic Nerve 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), Taurine (250 mg) and N-acetylcysteine (NAC) (300 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 cells<sup>20</sup> from glutamate toxicity and nerve tissue from oxidative damage. Clinically, it has been reported to support visual function in those treated with IOP-lowering therapy<sup>21</sup>.

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 dilate<sup>22</sup>. The amount of taurine included is about twice the typical dietary intake – an ample amount to offset age-related declines in retinal levels.

NAC, within cells, provides a key amino acid to produce the ocular defense enzyme called glutathione. Lower glutathione levels have been linked with late stage glaucoma. In experimental studies, glutathione protects against potentially damaging nitric oxide radicals. An acute dose is reported to support glutathione levels in healthy women<sup>23</sup>. Optic Nerve Formula contains an NAC level that helps ensure adequate glutathione production.

## Quercetin (50 mg) and Magnesium (120 mg)

Optic Nerve 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 individuals<sup>24</sup>. 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 benefit<sup>25</sup>. This formula provides concentrated and well tolerated sources of magnesium.

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