

# DiaVis<sup>®</sup> Capsules

## Description

DiaVis is a specialized formula providing nutritional support for people with type 1 and 2 diabetes, and pre-diabetes. It offers tailored antioxidant and nutrient support for visual, nerve and kidney health in 2 capsules daily.

## DiaVis Highlights

- ▶ Delivers key antioxidants to help combat oxidative stress and inflammation
- ▶ Contains critically important nutrients whose status may be low in diabetics
- ▶ Provides potent polyphenol blend to support small vessel & cardiovascular health
- ▶ Manufactured in NSF<sup>®</sup>-certified facilities from finest quality, bioavailable ingredients

## Oxidative Stress & Diabetes

Diabetics are at increased risk for vision loss, and oxidative stress is a major contributing factor. Oxidative stress is an imbalance between production of reactive oxygen and the body's ability to quench these compounds or repair resulting damage. Excess blood glucose leads to overproduction of oxygen free radicals, oxidation of glucose and excess glycosylated (sugar-bound) proteins – factors leading to the development of diabetic complications<sup>1,2</sup>. Lower antioxidant status has been seen in type 1 and 2 diabetics and those with retinopathy<sup>3</sup>. Enhanced output of inflammatory substances also plays a role in eye, nerve, kidney and cardiovascular complications<sup>4</sup>. DiaVis emphasizes robust levels of key antioxidants to bolster defenses, and provides clinically tested polyphenols to help dampen inflammation.

## Rationale for Key Ingredients

### Vitamin C (550 mg)

Vitamin C, highly concentrated in the aqueous humor and nerve cells, is also an essential antioxidant in endothelial cells under oxidative stress. The endothelium – the cells that line blood vessels – is involved in many important functions. It helps control blood pressure through widening and constricting of vessels. High blood glucose impairs endothelial function – a prevalent issue in diabetes. Some studies link endothelial dysfunction with development or worsening of diabetic retinopathy. A meta-analysis of controlled trials found that over 500 mg vitamin C daily significantly improved endothelial function in diabetics and those with atherosclerosis<sup>5</sup>. DiaVis delivers vitamin C at a level consistent with that finding.

### Vitamin D (1,000 IU)

Vitamin D, at low blood levels, is another nutrient associated with endothelial dysfunction in type 2 diabetics<sup>6</sup>. Lower blood levels have been found in type 2s, especially those with proliferative diabetic retinopathy<sup>7</sup>, and are also associated with high HbA1C – the gold standard test for how well diabetes is controlled<sup>8</sup>. Vitamin D fights inflammation by reducing production of pro-inflammatory compounds (interleukins). Experts calculate 1,000 IU vitamin D daily is required to bring half the population into the range of serum D associated with multiple health endpoints. DiaVis supplies 1,000 IU, a safe level that allows for added vitamin D from a calcium or 'multi' supplement.

### Thiamin (113 mg Vitamin B1, from 200 mg Benfotiamine)

Diabetics commonly excrete more thiamin (B1) and have lower blood levels than non-diabetics<sup>9,10</sup>. B1 plays a role in glucose metabolism, and restoring B1 levels may offer support for those at risk of kidney disease (nephropathy) or nerve damage (neuropathy). In one trial, high dose B1 reduced serum creatinine in type 2s, while another trial found that B1 lowered urinary albumin excretion in type 2s with micro-albuminuria (creatinine and albumin are markers of kidney function)<sup>11,12</sup>. One form of thiamin, benfotiamine, is better absorbed and retained. In animal models of diabetes, benfotiamine blocks major pathways involved in vascular damage due to elevated blood glucose and prevents diabetic retinopathy. It may do so by protecting pericytes from effects of high glucose levels. Early loss of pericytes – cells that stabilize capillary walls – is a hallmark of retinopathy. Some, though not all, exploratory trials report benefit of benfotiamine in reducing neuropathy symptoms. The level in DiaVis is within the clinically tested range.

### Alpha Lipoic Acid (300 mg)

Alpha ( $\alpha$ ) lipoic acid is a fat and water-soluble antioxidant that plays a crucial role in the energy-producing mitochondria of cells. It regenerates other antioxidants including vitamins C, E and glutathione, a key antioxidant enzyme in eye tissue. In

preclinical studies,  $\alpha$ -lipoic acid has shown a protective effect against microvascular damage, and protection of mitochondria<sup>13</sup>.  $\alpha$ -lipoic acid is concentrated in nerve cells, and long-term trials report clinical benefit in diabetic polyneuropathy<sup>14</sup>. In a 3-month controlled trial, 300 mg of  $\alpha$ -lipoic acid stabilized contrast vision in type 1s and improved contrast vision in type 2s<sup>15</sup>.  $\alpha$ -lipoic acid may also aid weight maintenance, of particular importance for type 2s and pre-diabetics. A well-conducted controlled trial found 300 mg  $\alpha$ -lipoic acid daily promotes significantly better weight loss than a restricted-calorie diet alone<sup>16</sup>. DiaVis delivers 300 mg  $\alpha$ -lipoic acid per day.

### Lutein (2 mg) Zeaxanthin (120 mcg)

Lutein and zeaxanthin (L/Z) make up the retina's macular pigment, which filters blue (visible) light that can cause photo-oxidative damage. Plasma L/Z levels are reportedly lower in those with diabetic retinopathy, and lower macular pigment density has been observed in type 2 – with or without retinopathy – compared to non-diabetics<sup>17,18</sup>. Lutein has also been found to protect nerve cells in animal models of diabetic retinopathy. The lutein level in DiaVis doubles the average US dietary intake.

### Polyphenol Blend (680 mg) (♦)

Polyphenols are a large group of compounds found in fruits, vegetables, and spices. There are many different types of polyphenols and flavonoids, and some are emerging as potentially important in diabetes.

### ♦ Whole Grape Extract (350 mg) & Trans-Resveratrol (10 mg)

Pre-clinical evidence suggests trans-resveratrol (found in red wine) may benefit the eye's small vessel circulation via antioxidant and anti-inflammatory effects, and by blocking growth of abnormal blood vessels<sup>19</sup>. Results of several yearlong trials indicate trans-resveratrol and procyanidins in whole grape extract work together to benefit patients with diabetes, hypertension, or at high risk for CVD. In one, trans-resveratrol (8 mg) combined with whole grape extract (350 mg, no resveratrol), improved the inflammatory status and balance of



## Product Recommendation

It is recommended that DiaVis® be taken with OmegaAdvance®, a source of the omega-3 fats EPA and DHA with lutein and zeaxanthin. The ingredients in OmegaAdvance complement DiaVis by helping to guard against factors involved in detrimental changes to the retina's vessels and nerve cells. DiaVis can be combined with any other SBH product, such as: OcularProtect®, MacularProtect Complete® AREDS2 or Optic Nerve Formula®.

**Suggested Use:** Take a total of two capsules daily, with meals.

**Note:** Pregnant or lactating women or individuals with medical conditions should consult their physician. People with diabetes who take prescription medications should inform their primary care doctor when adding DiaVis to their daily regimen so that medication doses can be routinely monitored. Keep out of the reach of children. **Eye Care Professionals:** Please see [www.SBH.com/dvmed](http://www.SBH.com/dvmed) for potential drug-nutrient interaction information.

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 2 capsules	Servings per Container 30		
		Amount per Serving	% Daily Value
Vitamin C (as ascorbic acid)		550 mg	611%
Vitamin D (as cholecalciferol)		25 mcg	125%
Benfotiamine (Pro-Vitamin B1, thiamin)		200 mg	†
Polyphenol Blend		670 mg	†
VinCare® Whole Grape Extract ( <i>Vitis Vinifera</i> ) (80% polyphenols; 60% proanthocyanidins)		350 mg	†
Longvida® Optimized Curcumin Extract (from turmeric rhizome, 23% curcuminoids)		200 mg	†
Quercetin		50 mg	†
Bilberry Fruit Extract (25% anthocyanins)		25 mg	†
Pycnogenol® French Maritime Pine ( <i>Pinus pinaster</i> ) Bark Extract (65-75% procyanidins)		20 mg	†
Myricetin (from <i>Morella rubra</i> bark extract)		15 mg	†
Trans-resveratrol (from <i>Polygonum cuspidatum</i> root extract)		10 mg	†
Alpha Lipoic Acid		300 mg	†
Lutein (FloraGLO®)		2 mg	†
Zeaxanthin (FloraGLO®)		120 mcg	†

† Daily Value not established.

**Other Ingredients:** Bovine Gelatin, Water, Rice Flour, Magnesium Stearate, and Silica.

Contains soy.

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### ◆ Whole Grape Extract & Resveratrol (Continued)

clotting factors in patients (diabetes, high CVD risk) on statins, better than whole grape extract alone<sup>20</sup>. Whole grape extract (350 mg) has also been shown to reduce oxidative stress in pre-diabetic patients<sup>21</sup>. The level of whole grape extract and trans-resveratrol in DiaVis is consistent with those clinically tested.

### ◆ Optimized Curcumin Extract (200 mg)

Curcumin, from turmeric spice, has potent anti-inflammatory activity. It has been shown to prevent diabetic retinopathy in animal models, and to inhibit a trigger for new vessel growth (VEGF) in the retinas of these animals. Curcumin blocks epigenetic changes caused by high blood glucose – changes that may be a significant factor in diabetic complications<sup>22,23</sup>. While curcumin is poorly absorbed, a solid lipid form shows greatly enhanced bioavailability<sup>24</sup>. This form of curcumin was found to improve working memory, alertness and mood among older persons in a randomized trial. A reduction in LDL cholesterol was also noted<sup>25</sup>. The amount of optimized extract in DiaVis raises bloodstream curcumin to physiologically relevant levels.

### ◆ Quercetin (50 mg), Bilberry Extract (25 mg), Pycnogenol (20 mg) & Myricetin (15 mg)

Certain flavonoids appear to work together in protecting retinal health. In human retinal pigment epithelial cells and in animals, myricetin and quercetin combined were superior in reducing ocular inflammation than either alone. These flavonoids were also more effective when teamed with anthocyanins in reducing endoplasmic reticulum stress – a key risk factor for progression of diabetic retinopathy<sup>26</sup>. Bilberry anthocyanins have also been shown to protect the blood-retinal barrier that breaks down in diabetic retinopathy<sup>27</sup>. Two large scale studies examining intake of different flavonoids, linked higher consumption of quercetin and myricetin with lower type 2 diabetes incidence<sup>28,29</sup>. Pycnogenol® is a concentrated source of procyanidins – flavonoids that selectively bind to collagen and elastin in blood vessel walls to strengthen larger vessels and capillaries. High-dose Pycnogenol has been reported to lower CVD risk factors and reduce use of high blood pressure medication in type 2s. All of these flavonoids are included at levels that greatly increase typical dietary intakes.

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