NeuroRenew™

*Supports Healthy Nerve Function**

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NeuroRenew™ is a synergistic formulation featuring B vitamins, acetyl L-carnitine, and R-lipoic acid designed to support healthy nerve structure and function.* NeuroRenew™ may promote nerve regeneration, neurotransmitter function, and healthy pain responses.* NeuroRenew™ may be clinically relevant to individuals with nerve damage, diabetic complications, neurodegenerative diseases, and the aging population.*

Formula Highlights

- Includes bioavailable and bioidentical forms of B vitamins (vitamin B12, vitamin B6, folate, and benfotiamine, a vitamin B1 precursor) to support the nervous system*
- 1 g of acetyl L-carnitine per serving
- 200 mg of R-lipoic acid per serving
- Gluten-free, dairy-free, soy-free
- Non-GMO

Benefits*

- Supports healthy nerve function and structure
- Promotes the body's normal nerve regeneration processes
- Supports neurotransmitter function
- Supports normal pain responses

Supplement Facts

Serving Size 4 capsules
Servings Per Container 30

Amount Per Serving		% Daily Value
Vitamin B-6 (as Pyridoxal-5-Phosphate)	25 mg	1471%
Folate (as Quatrefolic® [6S]-5-methyltetrahydrofolate, glucosamine salt)	680 mcg DFE	170%
Vitamin B-12 (as Methylcobalamin)	2000 mcg	83333%
Acetyl L-Carnitine	1 g	*
Benfotiamine	300 mg	*
R-Lipoic Acid (Bio-Enhanced® RLA)	200 mg	*

*Daily Value not established.

Other Ingredients: Cellulose (capsule), stearates (vegetable source), dicalcium phosphate, silicon dioxide.

Nerve damage may be due to a single cause or, more commonly, a combination of factors, such as genetic polymorphisms, surgery, metabolic diseases, alcoholism, inflammation, compression, laceration, ischemia, chemotherapy, or a deficiency of neurotropic nutrients.[1] In chronic diseases like type 2 diabetes (T2DM), nerve regeneration may be impaired and may result in conditions like diabetic peripheral neuropathy (DPN), characterized by pain and loss of sensation. Neuropathy may begin in a prediabetic state, and it is estimated that 10% to 18% of diabetic patients present with nerve damage at the time of diagnosis.[2]

Vitamin B12 (as methylcobalamin) is considered neurotropic due to its essential roles in the central and peripheral nervous system.[3] B12 is required to synthesize myelin sheaths, the fatty protective substance that insulates axons and facilitates proper neuronal signal transmission.[3,4] B12 has been shown in rodent models to improve nerve terminal and axonal regeneration, increase nerve fiber density, and upregulate multiple neurotrophic factors, including nerve growth factor (NGF) and brain-derived neurotrophic factor (BDNF).[1] B12 may also support normal pain responses.[2] A deficiency of B12 is associated with neurological disorders and impaired cognitive function, which may be due to impaired neurotransmitter production, myelin lesions, or elevated homocysteine.[3] Elevated homocysteine levels may promote oxidative stress and nerve damage, and may be a risk factor for dementia, cognitive decline, and Alzheimer's disease.[1,3,5] A B12 deficiency is common in vegetarians, vegans, older adults, and those on certain pharmaceutical drugs.[3,6]

A systematic review of 24 studies concluded that B12 supplementation (ranging from 1,500 µg/day to 1,500 µg/week of methylcobalamin) might be clinically relevant to individuals with peripheral neuropathy due to its role in promoting myelination, increasing nerve regeneration, and decreasing ectopic nerve firing.[4] A 1-year randomized, double-blind, placebo-controlled trial (RCT) administered 1,000 µg/day of oral methylcobalamin or a placebo to 90 DPN patients. The results showed that the patients receiving methylcobalamin had increased B12 levels and improved neurophysiological parameters, sudomotor function, pain score, and quality of life.[2]

Vitamin B6 (as pyridoxal-5-phosphate) is also considered neurotropic.[1] B6 is a coenzyme in synthesizing neurotransmitters needed for synaptic transmission (e.g., dopamine, serotonin, gamma-aminobutyric acid [GABA]) and is required for sphingolipid synthesis, a constituent of myelin sheaths.[1,3] Furthermore, rodent models suggest that B6 may help to balance the activity of excitatory glutamatergic neurons.[1,3] Patients with carpal tunnel syndrome who received B6 supplementation (120 mg/day for 3 months) exhibited increased conduction velocity of sensory nerves and reduced clinical symptoms.[7] Similar to B12, suboptimal B6 status may result in elevated homocysteine levels.[3]

Folate (as 5-methyltetrahydrofolate [5-MTHF]) supports nerve health by promoting Schwann cell proliferation, migration, and secretion of NGF, as seen in vitro.[8] Folate is critical for developing the nervous system, where a deficiency of folate during pregnancy is associated with neural tube defects in newborns. Folate remains equally significant in supporting overall health during adulthood and the aging brain.[9] A retrospective cohort study concluded that a folate deficiency is a risk factor for neuropathy in patients younger than 40 and observed an inverse relationship between serum folate and the risk of peripheral neuropathy.[9] The adverse neurological consequences of folate deficiency may overlap with those of a B12 deficiency, and may also contribute to elevated homocysteine.[9] DPN patients (n = 40) who were administered 1 mg/day of folate for 16 weeks displayed a significant increase in serum folate levels and reduced serum homocysteine

levels compared to the placebo group.[10] Additionally, the DPN patients receiving folate supplementation had significantly increased sural amplitude of sensory nerves, amplitude, and velocity of motor nerves, which may be beneficial in promoting nerve conduction velocity.[10]

Benfotiamine (BFT) is a bioavailable, lipid-soluble precursor of thiamine (vitamin B1) that has been extensively studied and displays a beneficial effect on nerve health in human clinical studies and rodent models.[11] Thiamin is considered neurotropic by facilitating energy production needed for successful nerve regeneration.[1] BFT has successfully mitigated a thiamin deficiency common in T2DM patients and those with diabetic complications, such as DPN and retinopathy.[11] Moreover, BFT has demonstrated antioxidant and anti-inflammatory properties.[11] An RCT (n = 165) placed DPN patients into three groups — 600 mg/day of BFT, 300 mg/day of BFT, and a placebo. After six weeks, both BFT groups displayed improved neuropathic symptom scores compared to the placebo group.[12]

R-Lipoic Acid (as Bio-Enhanced® RLA) is a medium-chain fatty acid and a natural isomer component of alpha-lipoic acid (ALA) found in plants and animals.[6] One study investigated the bioavailability of Bio-Enhanced® RLA compared to that of ALA or plain RLA.[13] In this study, supplementation with 600 mg Bio-Enhanced® RLA resulted in an approximately three times higher "area under the plasma concentration versus time curve (AUC)" than 600 mg of ALA or plain RLA.[13] This may infer that 200 mg of Bio-Enhanced® RLA in the Designs for Health's NeuroRenew™ formula could be potentially equivalent to 600 mg of plain RLA or ALA with regard to plasma levels.

ALA has been shown to support nerve health by promoting antioxidant properties and mitigating the effects of oxidative stress.[14] In rodent models, ALA has shown improvements in nerve function recovery, conduction velocity, and axon and myelin regeneration after peripheral nerve injury.[14] The NATHAN trial, the longest and largest multi-center RCT involving patients with uncontrolled diabetes and DPN, demonstrated that patients who received 600 mg/day of ALA orally for 4 years had favorable effects on neuropathic symptoms.[6] In the case of carpal tunnel syndrome, an RCT (n = 20) assessed the effects of ALA (600 mg/day) or a placebo on clinical and neurophysiological recovery in patients one month before surgery and two months after surgery. The ALA group had significantly improved clinical and neurophysiological variables, including motor and sensory fiber latency and amplitude.[15]

Acetyl L-Carnitine (ALC) is the acetyl ester of L-carnitine, which can be synthesized in the brain, liver, and kidney or obtained dietarily.[6] ALC is essential for proper energy metabolism and has been shown to have antioxidant properties and help attenuate the effects of oxidative stress. ALC may help modulate neurotransmitter function (e.g., acetylcholine, serotonin, dopamine) and act on neurotrophic factors (e.g., NGF and metabotropic glutamate) in vitro, in vivo, and in animal models.[16,17] ALC supplementation between 500 to 3,000 mg/day has been shown to promote normal pain responses in experimental models.[16,17] For instance, a meta-analysis (n = 523) concluded that individuals receiving ALC supplements (between 1,000 to 3,000 mg/day) had significantly reduced neuropathic pain compared to placebo.[18] An RCT demonstrated that ALC supplementation between 1,500 to 3,000 mg/day may have beneficial effects on nerve conduction parameters and nerve fiber regeneration and is generally well tolerated.[6]

Synergistic Combinations: An RCT (n = 232) administered ALC (500 mg t.i.d.) or methylcobalamin (0.5 mg t.i.d.) to DPN patients for 24 weeks. At 24 weeks, patients from both groups had significant reductions in neuropathy symptoms score and neuropathy disability score, and improved neurophysiological parameters. No significant differences were found between the groups.[19] A 12-month clinical trial administered DPN patients a supplemental formulation of ALA (570 mg), B12 (250 mcg), and ALC (300 mg) per day or a placebo. Compared to the placebo group, the patients receiving the combined formula had improved quality of life perception and nerve conduction velocity and amplitude.[6] In another study involving DPN patients, BFT was combined (at two different serving sizes of 320 mg/day or 150 mg/day) with vitamin B6 and B12, or BFT alone (150 mg/day) for 6 weeks. Patients in all experimental groups displayed improved symptoms, but the best results were obtained in patients receiving the largest serving size of BFT.[20]

Recommended Use: Take 4 capsules per day, or as directed by your health-care practitioner (divided dosing recommended).

For a list of references cited in this document, please visit:

https://www.designsforhealth.com/api/library-assets/literature-reference---neurorenew-tech-sheet-references

Dosing recommendations are given for typical use based on an average 150 pound healthy adult. Healthcare practitioners are encouraged to use clinical judgement with case-specific dosing based on intended goals, subject body weight, medical history, and concomitant medication and supplement usage.

To contact Designs for Health, please call us at (860) 623-6314 or visit us on the web at www.designsforhealth.com.