Stirnerve™: Scientific Product Monograph

Composition per Tablet: Benfotiamine 100 mg, Alpha-Lipoic Acid 50 mg, Methylcobalamin 750 mcg, Pyridoxal-5-Phosphate 10 mg, L-Methylfolate 1.5 mg, Inositol 50 mg, Chromium Polynicotinate 200 mcg, Vitamin D3 250 IU.

Pharmacological Classification: Neurotropic Vitamin and Antioxidant Formula.

Indications and Usage: Adjunctive nutritional management in the symptomatic relief of neuropathic and dysesthetic symptoms associated with:

- Diabetic Peripheral Neuropathy
- Peripheral Neuropathy (of various etiologies)
- Traumatic Nerve Injuries
- Sciatica & Lumbar Radiculopathy
- Post-Herpetic Neuralgia
- Alcohol-Induced Neuropathy
- Drug-Induced Neuropathy

Dosage and Administration: One tablet, once daily, or as directed by a physician.

Presentation: Box of 30 tablets.

Mechanism of Action & Scientific Rationale

1. Benfotiamine (Fat-Soluble Vitamin B1 Analogue)
A lipid-soluble thiamine derivative with superior bioavailability compared to water-soluble salts (1). It elevates tissue transketolase activity, redirecting excess glycolytic intermediates (e.g., triose phosphates) in hyperglycemic states, thereby inhibiting the formation of advanced glycation end-products (AGEs) and activating the diacylglycerol-protein kinase C (DAG-PKC) pathway, key mediators of diabetic microvascular damage (2, 3). Demonstrated to improve nerve conduction velocity and reduce neuropathic pain scores in clinical studies (4).

2. R-Alpha-Lipoic Acid (ALA)
A potent amphipathic antioxidant that functions in both aqueous and membrane domains. It directly scavenges reactive oxygen species (ROS), chelates transition metals, and regenerates endogenous antioxidants (e.g., glutathione, vitamins C and E) (5). In insulin-resistant states, ALA enhances glucose uptake via modulation of the AMPK and PI3K/Akt

signaling pathways, improving peripheral insulin sensitivity (6). Clinical trials support its efficacy in reducing symptoms of diabetic sensorimotor polyneuropathy (7).

3. Methylcobalamin (Active Vitamin B12)
The metabolically active coenzyme form of cobalamin essential for methionine synthase activity in the methylation cycle. It is critical for the synthesis of S-adenosylmethionine (SAMe), required for phospholipid and myelin formation, and for the conversion of methylmalonyl-CoA to succinyl-CoA, a step in neuronal energy metabolism (8). Promotes axonal regeneration and exhibits direct neuroprotective effects by modulating aberrant neuronal nitric oxide synthase (nNOS) activity (9).

4. Pyridoxal-5-Phosphate (Active Vitamin B6)
The bioactive coenzyme form, bypassing hepatic conversion. Serves as an essential cofactor for over 140 enzymatic reactions, including the decarboxylation and transamination pathways responsible for synthesizing key neurotransmitters: GABA (via glutamate decarboxylase), serotonin, dopamine, and norepinephrine (10). Essential for sphingolipid and myelin sheath synthesis and maintenance (11).

5. L-Methylfolate (5-MTHF)
The biologically active form of folate that crosses the blood-brain barrier. It is the primary methyl donor for the remethylation of homocysteine to methionine, a process dependent on methylcobalamin (12). Elevated homocysteine is an independent risk factor for endothelial dysfunction and neurotoxicity. Adequate 5-MTHF supports nucleotide synthesis for nerve repair and optimizes neurotransmitter turnover (13).

6. myo-Inositol
A precursor for membrane-associated phosphatidylinositol and downstream second messengers (IP3, DAG) involved in cellular signal transduction, including insulin signaling and neuronal communication (14). It modulates serotonin receptor activity and is implicated in neuronal osmoregulation. Depletion is observed in diabetic nerves and may contribute to impaired nerve conduction (15).

7. Chromium Polynicotinate
A bioavailable source of trivalent chromium. It potentiates insulin action by amplifying insulin receptor tyrosine kinase activity, improving peripheral glucose disposal (16). Stabilizing postprandial glucose excursions mitigates one primary source of oxidative and

metabolic stress in peripheral nerves, indirectly supporting nerve cell energy homeostasis (17).

8. Cholecalciferol (Vitamin D3)
A seco-steroid hormone with pleiotropic effects. Via nuclear Vitamin D Receptor (VDR) activation in neural and glial cells, it upregulates the synthesis of neurotrophic factors (e.g., NGF, GDNF) crucial for neuronal survival, differentiation, and repair (18). Exhibits immunomodulatory properties by shifting T-cell responses from a pro-inflammatory (Th1/Th17) to a regulatory (Treg) profile, potentially reducing autoimmune-mediated nerve inflammation (19).

References

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