Neuropathy Protocol

Clinical Protocol to Support Healthy Nervous System Function*

designs for health®

Pathophysiology of Neuropathy

Neuropathy, also referred to as peripheral neuropathy (PN), indicates damage or dysfunction of one or more nerves of the peripheral nervous system (PNS).[1,2] The PNS is a complex communication network composed of peripheral sensory, motor, and autonomic nerves that carry messages to and from the central nervous system (brain and spinal cord) to all other parts of the body.[1,2] Damaged or destroyed neurons, which manifest secondary to a variety of pathologies, disrupt this communication pathway resulting in neuropathy.[2]

More than 100 different types of peripheral neuropathies have been identified that affect approximately 2.4% of the population, increasing to 8% in older adults.[2] Neuropathy occurs in nearly half of diabetics.[2] Common symptoms associated with neuropathy are pain, numbness, weakness, and a loss of deep tendon reflexes.[1,2] Addressing the underlying cause of neuropathy — instead of treating the symptoms — is essential to help attenuate progression and possibly even reverse the condition altogether. Diabetes, alcoholism, nutritional deficiencies, inflammatory conditions, autoimmune disease, hypothyroidism, viral infections, heavy metal toxicity, chemotherapy, certain medications, and physical trauma or injury are just some of the underlying etiologies to consider when addressing PN.[2] Due to the increasing recognition of an association between metabolic syndrome and neuropathy, dietary and lifestyle interventions are foundational components in neuropathy management.[3]

Diagnostic Biomarkers and Clinical Indicators of Neuropathy

Depending on the underlying cause of neuropathy, consider the following tests to evaluate and rule out potential etiologies[2,4]:

- Comprehensive heavy metal testing
- Hemoglobin A1c, fasting blood glucose, and Homeostatic Model Assessment of Insulin Resistance (HOMA-IR)
- Complete blood count and metabolic panels to assess anemia or electrolyte imbalances
- Bio-impedance analysis to assess body composition, as visceral fat is significantly correlated with diabetic PN[5]
- **Metabolomics Spotlight testing** to assess vitamin or mineral deficiencies
- Full thyroid function test
- Antibody testing for autoimmune disorders such as Sjogren's syndrome, lupus, and rheumatoid arthritis
- Infectious testing for Lyme disease, Epstein-Barr virus, hepatitis C, HIV, and syphilis
- Nerve conduction study and electromyography
- MRI or CT scans
- Neuropathic pain screening tools (e.g., Neuropathic Pain Questionnaire, PainDETECT, Douleur Neuropathique 4 [DN4] Questionnaire, and Leeds Assessment of Neuropathic Symptoms and Signs pain scale assessment)[6]

Therapeutic Diet and Nutritional Considerations

- Recommend a low-glycemic, anti-inflammatory diet, avoiding sugars, hydrogenated oils, and highly processed foods to support healthy blood sugar metabolism
- Direct patients to:
  - Choose complex, low-glycemic carbohydrates, such as non-starchy vegetables, dark leafy greens, sprouted beans and legumes, and low-sugar fruits
  - Consume fresh herbs and spices to support healthy detoxification function (e.g., cilantro, parsley, turmeric, and ginger root)[4,7]
  - Avoid large predatory fish consumption (e.g., tuna, marlin, swordfish, tilefish, king mackerel)[4] and opt for low-mercury fish that is high in omega-3 fatty acids (sardines, anchovies, herring, sockeye salmon)
- Eat foods rich in B vitamins, as they are essential for the body's natural nerve repair process
  - Grass-fed, grass-finished beef; pastured poultry, pork, and eggs; wild-caught fish and shellfish; liver and other organ meats; milk and yogurt; nutritional yeast; leafy greens; beans/legumes
- Eat foods naturally rich in nitrates, L-arginine, and antioxidants (or take supplementation such as Vascanox HP®) to encourage nitric oxide production to help restore blood flow to nerves
  - Beetroot, dark leafy greens and herbs, meat, citrus fruits, spirulina, raw cacao, pomegranate

Lifestyle Interventions

- Over 200 chemicals are known to be neurotoxic; exposure to certain heavy metals, organic solvents commonly used in occupational and recreational settings, alcohol, and medications are associated with PN.[8,9] To reduce toxin exposure, direct patients to do the following[10]:
  - Drink and cook with filtered water only
  - Avoid alcohol and tobacco
  - Replace common household cleaners, cookware, and personal care products with more natural alternatives
- Recommend alternative and mindfulness-based modalities, such as acupuncture, neuromuscular electrical stimulation, myofascial massage, reflexology, chiropractic, physical therapy, Tai Chi, yoga, and/or activated isolated stretching method[3,11]
- Encourage daily exercise, as aerobic and strengthening activity may help improve neuronal function and functional mobility, and these activities may help reduce neuropathic pain and other types of sensory dysfunction[12]
- Recommend patients oscillate between sitting and standing every 30 minutes; avoid being sedentary for long periods of time

This information is provided as a medical and scientific educational resource for the use of physicians and other licensed health-care practitioners ("Practitioners"). This information is intended for Practitioners to use as a basis for determining whether to recommend these products to their patients. All recommendations regarding protocols, dosing, prescribing and/or usage instructions should be tailored to the individual needs of the patient considering their medical history and concomitant therapies. This information is not intended for use by consumers.

Supplement Protocol

Primary Support:

Metabolic Synergy™

Dose	Take 3 capsules two times per day	**Duration**	3 months and re-assess
Formula Highlights	Metabolic Synergy™ helps maintain healthy glucose and insulin metabolism while supporting the conversion of carbohydrates to be used for energy by providing nutrients for the tricarboxylic cycle.* The chromium, zinc, selenium, manganese, and molybdenum are provided as true chelates for maximum absorption and bioavailability. This formula also contains targeted levels of R-lipoic acid, taurine, and carnosine to support healthy glucose metabolism.*		

NeuroRenew™

Dose	Take 4 capsules per day. Divided dosing recommended	**Duration**	3 months and re-assess
Formula Highlights	NeuroRenew™ is a comprehensive formula designed to support healthy nerve function and repair.* It contains lipoic acid, which has potent antioxidant properties, and several members of the B vitamin family, including B1 (as benfotiamine), B6, B12, and folate. Acetyl L-carnitine is also included in this formula, as it helps support brain health and may help promote the production of acetylcholine — the neurotransmitter that works to regulate communication between nerve and muscle cells. The fat-soluble form of B1, benfotiamine, is especially important for the body's normal neuronal and nerve tissue regeneration processes.*		

PS 150

Dose	Take 2 capsules per day	**Duration**	3 months and re-assess
Formula Highlights	PS 150 features 150 mg of non-soy, sunflower-sourced phosphatidylserine (PS) per capsule. PS is a nutrient that is essential for the support of optimal brain function.* PS helps support neuronal communication, memory, and healthy hormone balance.* There are no foods rich in PS, so supplementation is essential to increase the body's levels of this brain-supportive nutrient.*		

For a list of references cited in this document, please visit:
https://www.designsforhealth.com/api/library-assets/literature-reference---neuropathy-protocol-references

Dosing recommendations are given for typical use based on an average 150 pound healthy adult. Health-care 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. Any product containing botanical substances has the potential for causing individual sensitivities, appropriate monitoring, including liver function tests (LFT) is recommended.

For considerations regarding herb-drug and nutrient-drug interactions, please refer to reliable, evidence-based resources such as the Natural Medicine Database or Stargrove MB, Treasure J, McKee DL. *Herb, Nutrient, and Drug Interactions: Clinical Implications and Therapeutic Strategies.* St. Louis, MO: Mosby-Elsevier; 2008.

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