designs for health®

Chronic Fatigue Syndrome Protocol

Clinical Protocol to Mitigate Fatigue and Support Mitochondrial Energy Production*

The Pathophysiology of Chronic Fatigue Syndrome

The mystery shrouding a debilitating illness began in the mid-1980s when an outbreak of "chronic flu-like" cases spread across the U.S., which was first named Chronic Fatigue Syndrome (CFS) by the Centers for Disease Control (CDC).[1] More recently, the World Health Organization (WHO) classified CFS "as a disorder of the brain"[2] or central nervous system. CFS is now also referred to as myalgic encephalomyelitis (ME) and systemic exertion intolerance disease (SEID), yet the debate over its etiology and specific treatments for improvements have not been fully resolved.[1]

It is estimated that roughly 1.7 to 3.4 million Americans suffer from CFS; however, 84% to 91% of CFS patients are undiagnosed.[3] This complicated illness involves extreme fatigue (of at least six months up to several years) without relief from rest.[4] The inability to function normally due to a lack of energy is typical for CFS patients, along with a host of other symptoms that may include depression, neurocognitive dysfunction, and overall body pain. Researchers have found that CFS may have a correlative, if not causal, relationship with oxidative stress, inflammation,[5] and mitochondrial dysfunction.[6] Increased professional health-care knowledge for timely diagnosis and alleviation of symptoms with supplementation, graded exercise therapy, and cognitive behavioral therapy has been found to help.

This clinical protocol is designed to support energy production, normal pain responses, and emotional and mental well-being for individuals with chronic fatigue syndrome through evidence-based lifestyle, dietary, and nutrient interventions.*

Diagnostic Biomarkers and Clinical Indicators of Chronic Fatigue Syndrome

- Currently, there are no standardized biomarkers that provide differential diagnosis of CFS/ME. Diagnosis by exclusion is often utilized, with the following clinical features considered evidence of the condition[7]:
  - Post-Exertional Malaise (PEM)
    - Characterized by extreme exhaustion, pain, cognitive deficits following exertion
    - PEM may be due to mitochondrial dysfunction, secondary to mitochondrial damage and/or inhibition of the oxidative metabolism as a consequence of excessive and prolonged oxidative stress after exertion.[8,9]
  - Neurocognitive impairment
  - Dysfunctional sleep
- Other aspects of pathophysiology can be evaluated:
  - Immune Dysfunction
    - Potential markers for immune activation include elevated cytokine levels and inflammatory markers
  - Autonomic Dysfunction
    - Tilt table test showing decreased blood pressure and/or increased heart rate[10]
    - Heart rate variability (HRV) measurement
    - Composite Autonomic Symptom Scale[11]
- Consider Designs for Health Metabolomics Spotlight™ functional wellness test to assess markers of mitochondrial health, neurotransmitter metabolism, stress, mood, and inflammatory responses

Therapeutic Diet and Nutritional Considerations

- Support patient's sleep patterns through sleep hygiene practices
- Manage patient's stress through mind-body practices
- Encourage early morning physical activity in sunlight or direct light to support cortisol-awakening response

Lifestyle Interventions

- Counsel patients to maintain proper hydration
- Advise patients against excess caffeine intake and consumption of sweetened beverages and energy drinks
- Support patient's blood sugar management through low-to-moderate carbohydrate diets rich in protein and fat
- Recommend a foundational, nutrient-dense diet replete with micronutrients integral to cellular energy production such as CoQ10, carnitine, magnesium, and B vitamins
- Consider trialing a ketogenic diet to support efficient ketone energy production

Supplement Protocol

Primary Support:

Secondary Support:

Mitochondrial NRG™

Dose	2 capsules twice per day with meals
Duration	Ongoing as needed

Formula Highlights

Mitochondrial NRG™ is a formulary blend of nutrients, nutraceuticals, botanicals, and Krebs cycle intermediates designed to support efficient mitochondrial metabolism and energy (ATP) production for increased vitality.* Mitochondrial NRG™ was designed to support the function of the mitochondria, "the powerhouse of the cell." This formula may be appropriate for anyone wishing to promote overall cellular and tissue vitality and health, including those wanting to increase energy output for athletic performance.

Mito-PQQ™

Dose	1 capsule twice per day
Duration	Ongoing as needed

Formula Highlights

Mito-PQQ™ is designed to help support optimal mitochondrial biogenesis, which is critical for the promotion of healthy aging, optimal energy production, and protection from reactive oxygen species (oxidative stress). Mito-PQQ™ features pyrroloquinoline quinone (PQQ), a water-soluble, vitamin-like compound, and *Rhodiola rosea*, a popular adaptogen. PQQ is an enzyme cofactor possessing antioxidative, neuroprotective, and cardioprotective properties that encourage mitochondrial biogenesis. *Rhodiola rosea* helps support the adrenal glands. Research shows that *Rhodiola rosea* is a powerful herb for enhancing mitochondrial energy production and helps defend against free radicals in the nervous system as well as the mitochondria.*

D-Ribose

Dose	5 grams (approximately one scoop) per day
Duration	Ongoing as needed

Formula Highlights

D-Ribose synthesizes adenine nucleotides, which are required by cardiac muscle and other tissue to make adenosine triphosphate (ATP), the primary source of energy used by all cells to maintain normal health and function.* D-Ribose may be ideal for individuals looking to promote their energy production and those seeking to support their cardiovascular health.* This formula provides 5 g of D-ribose per serving in a convenient, unflavored powdered delivery that mixes easily in liquids.

Adrenotone™

Dose	1 capsule three times per day with meals
Duration	Ongoing as needed

Formula Highlights

Adrenotone™ is a combination of standardized adaptogenic herbs and nutrients which are known to contribute to rejuvenating the adrenals. This product is designed to help support healthy cortisol levels, hypothalamic and pituitary function (HPTA axis), and catecholamine production (dopamine, norepinephrine, and epinephrine).*

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

***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.**