Metabolic Syndrome Support Protocol

Clinical Protocol to Support Metabolic Syndrome*

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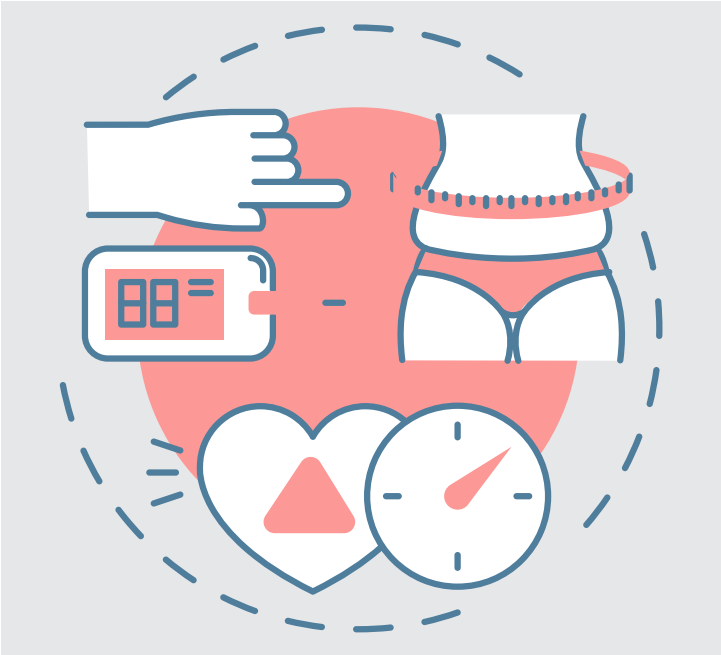


The Pathophysiology of Metabolic Syndrome

Metabolic Syndrome (MetS), also known as Syndrome X, is defined by the presence of at least three of the following metabolic dysregulations and risk factors: abdominal adiposity, dyslipidemia, decreased high-density lipoprotein cholesterol (HDL-C), hypertension, and hyperglycemia.[1,2] In developed countries, MetS occurs in approximately 20% to 25% of adults and continues to increase in time.[2] MetS increases the risk of developing type 2 diabetes fivefold and cardiovascular disease twofold.[3,4] Chronic conditions such as neurodegenerative diseases, nonalcoholic fatty liver disease, atherosclerosis, reproductive disorders, and an increase in all-cause mortality are also associated with MetS.[2] Early detection of MetS can assist in mitigating chronic diseases and cardiovascular complications and interventions.[5]

The pathophysiology of MetS is not entirely understood, but it has been associated with chronic low-grade inflammation, insulin resistance, hormonal dysregulation, and genetic and epigenetic factors.[6] Contributing factors to MetS may include overeating, lack of physical activity, processed foods, gastrointestinal microbiota imbalance, and dysregulated sleep patterns and circadian rhythm.[1,3,4,6-9]

MetS can be supported by lifestyle, dietary, and environmental factors that may promote normal metabolic health.* This clinical protocol is designed to help support MetS.*

Diagnostic Biomarkers and Clinical Indicators for MetS

Several organizations have outlined diagnostic criteria for MetS.[5] According to the American Heart Association, MetS is diagnosed when a patient has three or more of the risk factors outlined as follows.[5]

- Large waist circumference (>40 inches in males and > 35 inches in females)
- Elevated fasting triglycerides (≥150 mg/dL)
- Decreased HDL-C (<40 mg/dL in males and <50 mg/dL in females)
- Hypertension (>130/85 mmHg)
- Elevated fasting glucose (>100 mg/dL)

Conduct a thorough review of family history and complete a physical examination. Further testing includes the following:

- Assess Gastrointestinal Microbial Assay Plus (GI-MAP). Relevant bacterial strains associated with MetS include, but are not limited to the following:
  - Altered ratio of *Firmicutes* to *Bacteroidetes*[6,8]
  - Alterations of *Lactobacillus, Proteobacteria,* and *Clostridium*[8]
- Assess cellular metabolic function and potential pathogens with organic acid testing
- Blood pressure, homocysteine, hemoglobin A1C, C-reactive protein, and fasting insulin

Therapeutic Diet and Nutritional Considerations

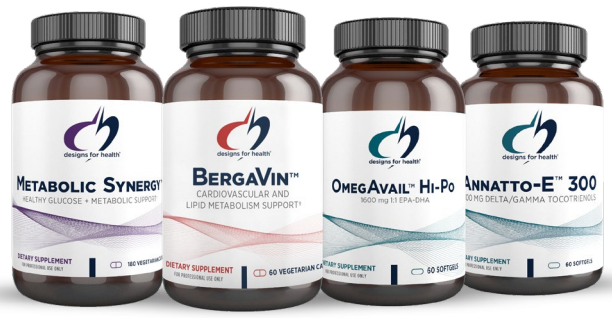
- Educate patients on calorie restriction techniques, such as time-restricted feeding and intermittent fasting. These techniques have been shown to promote healthy metabolic regulation.[2,3]
- Encourage intake of colorful fruits, vegetables, herbs, and spices rich in essential nutrients and polyphenolic compounds to help support overall metabolic health, mitigate inflammation, and support overall cell function (e.g., olive oil, cinnamon, rosemary, curcumin, ginger, and garlic).[1,6]
- Advise patients on proper dietary fiber intake to increase the production of beneficial short-chain fatty acids (e.g., acetate, propionate, and butyrate) and a healthy gut microbial environment.[6,8,9] Gut microbiome changes have been associated with MetS.[8,9]

Lifestyle Interventions

- Encourage consistent physical activity such as endurance and resistance exercise to promote healthy blood sugar regulation, inflammatory response, and body weight.[1,7]
- Counsel patients on sleep hygiene techniques to improve sleep quality, including sleeping in a cool environment, reducing blue light exposure prior to bedtime, and overnight fasting. Sleep disorders are associated with MetS.[4,8]

Supplement Protocol

Primary Support:



Metabolic Synergy™

Dose	3 capsules twice per day with meals
Duration	Ongoing as needed
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 acid cycle (TCA).* The chromium, zinc, selenium, manganese, and molybdenum are provided as true chelates for maximum absorption and bioavailability. This formula also contains optimal levels of R-lipoic acid, taurine, and carnosine to support healthy glucose metabolism.*

BergaVin™

Dose	2 capsules per day with a meal
Duration	Ongoing as needed
Formula Highlights	BergaVin™ features the trademarked ingredients Bergavit® 40 bergamot and Vinia® red grape powder with research demonstrating their potential to support cardiovascular health.* The polyphenols and flavonoids in bergamot and red grapes support healthy cholesterol metabolism.* These ingredients also support antioxidant status and promote a healthy inflammatory response to help promote coronary health.*

OmegAvail™ Hi-Po

Dose	2 softgels twice per day with meals
Duration	Ongoing as needed
Formula Highlights	OmegAvail™ Hi-Po is our highest potency omega-3 product, providing 1,600 mg of eicosapentaenoic acid (EPA)/docosahexapantaenoic acid (DHA) per 2-softgel serving in a 1:1 ratio. Omega 3-fatty acids also promote a healthy inflammatory response, cell membrane integrity, and normal cholesterol and triglyceride metabolism.*

Annatto-E™ 300

Dose	1 softgel per day with a meal
Duration	Ongoing as needed
Formula Highlights	Annatto-E™ 300 is a unique tocopherol-free, tocotrienols-only product featuring tocotrienols sourced from the annatto tree. Annatto is the richest known source of tocotrienols, containing 100% tocotrienols (90% delta and 10% gamma isomers), with no tocopherols. Annatto-E™ 300 contains 300 mg per softgel of delta- and gamma-tocotrienols. Commercial vitamin E supplements are typically rich in tocopherols and low or absent in tocotrienols. However, tocotrienol fractions have unique beneficial effects across a variety of tissues that make them desirable for supporting many aspects of health. Research indicates that tocopherols — especially alpha tocopherol — may interfere with key beneficial effects of tocotrienols, so it may be best to dose tocotrienols alone, without tocopherols. Annatto-E™ 300 supports overall metabolic health by promoting healthy inflammatory responses, cholesterol and triglyceride metabolism, blood pressure and blood vessel function, and blood glucose and insulin metabolism.*

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

https://www.designsforhealth.com/api/library-assets/literature-reference---metabolic-syndrome-support-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 DLHer. *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.**

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