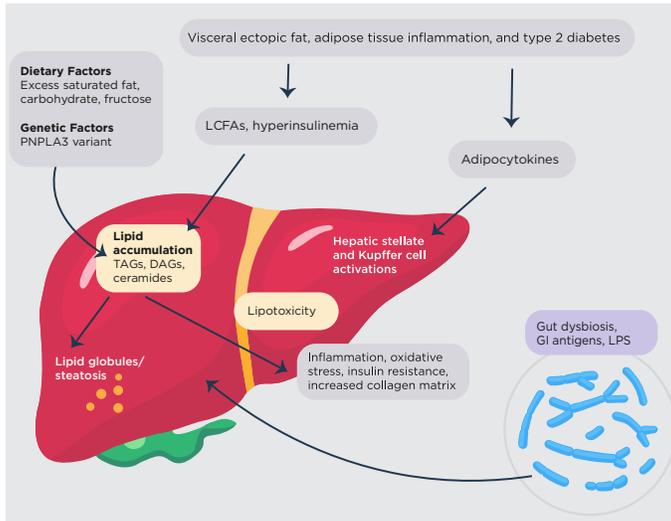


# Non-alcoholic Fatty Liver Disease

## Clinical Protocol to Support Healthy Liver Function\*



### The Pathophysiology of NAFLD

The prevalence of non-alcoholic fatty liver disease (NAFLD) affects 25% of the global adult population, including 80% to 90% of obese individuals, and is rapidly becoming the most common liver disease worldwide.<sup>1</sup> Nonalcoholic fatty liver disease is a precursor to more advanced non-alcoholic steatohepatitis (NASH) and is closely associated with metabolic comorbidities including obesity, type 2 diabetes, hypertension, and hypercholesterolemia.<sup>1</sup> As such, addressing these common conditions of metabolic syndrome and supporting healthy liver function serves as a deterrent for progression of NAFLD into NASH and the irreversible effects of cirrhosis. Dietary modification is a critical component in intervention, as NAFLD is mediated by excess glycemic load and high consumption of refined carbohydrates.

Sedentary lifestyle serves as a contributing factor of fatty liver development, with exercise exhibiting positive benefits to blood glucose regulation, lipid status, hepatic fat mobilization, hepatocyte function, and weight in NAFLD.<sup>2,3</sup>

Interventions with select nutrients and botanicals such as delta- and gamma-tocotrienols, milk thistle, n-acetyl-cysteine, and a variety of mushrooms have demonstrated lipid-supportive properties.<sup>4\*</sup>

This clinical protocol is designed to support glucose metabolism and healthy liver function through evidence-based dietary, lifestyle, and nutritional interventions for individuals presenting with NAFLD.\*

### Diagnostic Biomarkers and Clinical Indicators of NAFLD

#### • Conduct a thorough physical exam for signs of NAFLD:

- Palpable, enlarged liver
- Signs of insulin resistance, such as darkened skin patches over the knuckles, elbows, and knees
- Yellowing of the skin or eyes
- Spider-like blood vessels on the skin
- Large waist-to-hip ratio

#### • Liver function tests

- ALT
- AST
- GGT
- Albumin
- Globulin
- A/G ratio

#### • Complete Lipid Panel

- Total cholesterol
- Triglycerides

#### • Glucose Metabolism Profile

- Fasting glucose
- Fasting insulin
- HbA1c

#### • **DFH Metabolomic, Genomics, and GI Spotlight™ testing**

- Detoxification
- Inflammatory Dysbiosis/LPS
- Gut Barrier Integrity
- Energy Metabolism

### Therapeutic Diet and Nutritional Considerations

- Recommend a low-glycemic or Mediterranean diet. The Mediterranean diet has been shown to reduce hepatic steatosis and improve insulin sensitivity in NAFLD patients.<sup>5</sup>
- Guide patients to increase dietary omega-3 intake through EPA and DHA-rich foods such as wild salmon, sardines, halibut, mackerel and/or supplement with a quality, omega-3 fatty acid formula. Studies examining omega-3 supplementation in NAFLD intervention show a range of 1 to 6 g/day as beneficial, with 3 to 6 g exhibiting greater effects on liver function and lipid status.<sup>6,7</sup>
- Advise avoiding alcohol consumption
- Recommend reducing fructose consumption by limiting fruit intake, and avoiding refined fructose and products containing high-fructose corn syrup
- Support healthy gut microbial balance by optimizing dietary fiber intake, avoidance of GI irritants, and removal of antigenic dietary compounds. Evidence points to gut dysbiosis, lipopolysaccharides, and intestinal permeability as potential mediators of NAFLD pathogenesis<sup>8-10</sup>

### Lifestyle Interventions

- Recommend an increase in physical activity with a focus on resistance exercise as a means to support insulin function
  - Muscular contraction performed during strength training exercise facilitates insulin-independent glucose transport.
- Encourage patients to achieve a healthy weight

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:



### Annatto-E® 300

<b>Dose</b>	1 softgel with breakfast and 1 softgel with dinner (2 softgels per day)	<b>Duration</b>	12 weeks; retest biomarkers
<b>Formula Highlights</b>	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/gamma tocotrienols. Vitamin E tocotrienols have been shown to support metabolic and liver health, specifically in individuals with NAFLD.*		

### Hepatone Plus™

<b>Dose</b>	2 capsules with breakfast and 2 capsules with dinner (4 capsules per day)	<b>Duration</b>	12 weeks; retest biomarkers
<b>Formula Highlights</b>	Hepatone Plus™ is formulated to help support healthy liver function and structure, and to maintain proper liver enzyme metabolism.*		

### OmegAvail™ TG1000

<b>Dose</b>	3 softgels per day	<b>Duration</b>	12 weeks; retest biomarkers
<b>Formula Highlights</b>	OmegAvail™ TG1000 is a highly potent, non-GMO fish oil, containing an impressive 1,000 mg of omega-3 oils per softgel, making it an ideal choice when higher doses are recommended. Each softgel contains 662 mg EPA and 250 mg DHA, along with other omega-3 fatty acids. The fish oils are ultra-purified and micro-distilled to remove all contaminants and are delivered as BioGlycerides™ for enhanced absorption and bioavailability.		

Adjunct Support:

### ProbioMed™ 100

<b>Dose</b>	1 capsule per day with a meal	<b>Duration</b>	12 weeks; retest biomarkers
<b>Formula Highlights</b>	ProbioMed™ 100 is a high potency, shelf-stable, dairy-free probiotic that contains 100 billion CFUs per serving. It consists of ten of the most highly researched probiotic strains, with each strain and specific CFU count being fully disclosed. These robust strains support gut microbial balance, which helps regulate metabolism and the gut-liver axis.*		

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

<https://www.designsforhealth.com/api/library-assets/literature-reference---non-alcoholic-fatty-liver-disease-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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\*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.