Nutritional Testing
Effective tools for complex chronic illnesses

Target *personalized*

patient recommendations with Genova Diagnostics' innovative line of nutritional tests

GENOVA DIAGNOSTICS®

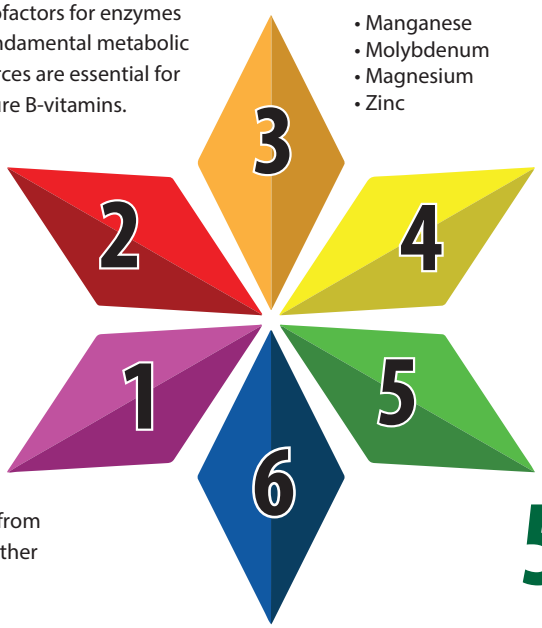
Genova Diagnostics' line of nutritional tests provide insight through comprehensive panels and concise profiles for assessing one specific area of concern.

NutrEval NutrEval is Genova's most comprehensive nutritional evaluation to identify specific imbalances of vitamins, nutrients, and essential co-factors. It achieves this by combining analysis of organic acids, amino acids, essential fatty acids, oxidative stress and elemental markers.

Metabolomix+ Metabolomix+ is a nutritional evaluation that includes key organic acids and amino acids to evaluate the functional need for antioxidants, B-vitamins, minerals, digestive support, and amino acids. Metabolomix+ is a non-invasive test that requires no blood draw.

ION (Individual•Optimal•Nutrition) ION (Individual•Optimal•Nutrition) provides a combination of analyses that measures levels of organic acids, fatty acids, amino acids, vitamins, minerals, and antioxidants, offering a complete evaluation of functions that impact patients' mental and physical well-being. **The ION Profile is available in New York State.**

Our most comprehensive nutritional diagnostics provide a framework of core nutrients in 6 key areas:



3 Minerals play a vital role as cofactors for a wide variety of enzymatic processes. Functional levels for four minerals are provided.

- Manganese
- Molybdenum
- Magnesium
- Zinc

2 B-Vitamins are cofactors for enzymes and are essential to fundamental metabolic processes. Dietary sources are essential for the body to manufacture B-vitamins.

- B-1 Thiamin
- B-2 Riboflavin
- B-3 Niacin
- B-6 Pyridoxine
- B-7 Biotin
- B-9 Folic Acid
- B-12 Cobalamin

4 Essential Fatty Acids are not made by the body but are required for optimal functioning of a variety of physiologic processes. They must be obtained through diet to preclude deficiencies from occurring.

- Recommendations for supplementation of Omega 3 fatty acids are provided.
- The Omega 3 Index – an indicator of cardiovascular risk – is highlighted as well.

1 Anti-Oxidants prevent cellular damage. Necessary anti-oxidants that are not produced by the body and must be obtained from the diet include Vitamins C and E. Other anti-oxidants (such as glutathione, lipoic acid and CoQ-10) are formed endogenously, but have declining levels with age and may warrant replacement.

- Vitamin A / Carotenoids
- Vitamin C
- Vitamin E / Tocopherols
- Lipoic Acid
- CoQ-10
- Glutathione
- Plant-Based Anti-Oxidants

5 Digestive Support needs are assessed and recommendations are made in two categories to optimize digestion and absorption of macronutrients and micronutrients.

- Pancreatic enzyme support
- Probiotic supplementation

6 Amino Acids are building blocks of protein, important for structural support, neurotransmitter and hormone synthesis, energy generation, and detoxification.

- Amino acid levels determine the need for amino acid recommendations
- Dietary Peptide Related Markers indicate protein intake and breakdown

INDIVIDUAL COMPONENTS

Biomarkers Reported	NE PLS* 3001	NE FMV*	META+* 3200	ION 3100	ION AA40 3102
Amino Acids					
1-Methylhistidine	•	•	•		•
3-Methylhistidine	•	•	•		•
α-Aminoadipic Acid	•	•	•		•
α-Amino-N-Butyric Acid	•	•	•		•
ß-Alanine	•	•	•		•
ß-Aminoisobutyric Acid	•	•	•		•
Alanine	•	•	•		•
Anserine		•	•		•
Arginine	•	•	•	•	•
Asparagine	•	•	•	•	•
Aspartic Acid	•	•	•	•	•
Carnosine		•	•		•
Citrulline	•	•	•	•	•
Cystathionine	•	•	•		•
Cysteine	•	•	•		
Cystine		•	•		•
Ethanolamine	•	•	•		•
Gamma-Aminobutyric Acid	•	•	•		•
Glutamic Acid	•	•	•	•	•
Glutamine	•	•	•	•	•
Glycine	•	•	•	•	•
Histidine	•	•	•	•	•
Homocystine					•
Hydroxylysine					•
Hydroxyproline					•
Isoleucine	•	•	•	•	•
Leucine	•	•	•	•	•
Lysine	•	•	•	•	•
Methionine	•	•	•	•	•
Ornithine	•	•	•	•	•
Phenylalanine	•	•	•	•	•
Phosphoethanolamine	•	•	•		•
Phosphoserine	•	•	•		•
Proline	•	•	•		•
Sarcosine	•	•	•		•
Serine	•	•	•	•	•
Taurine	•	•	•	•	•
Threonine	•	•	•	•	•
Tryptophan	•	•	•	•	•
Tyrosine	•	•	•	•	•
Valine	•	•	•	•	•
Urea	•	•	•		
Amino Acid Ratios					
Glutamine/Glutamate				•	•
Phenylalanine/Tyrosine				•	•
Hydroxyproline/Proline					•
α-ANB/Leucine					•

Biomarkers Reported	NE PLS* 3001	NE FMV*	META+* 3200	ION 3100	ION AA40 3102
Organic Acids					
Fatty Acid Metabolism					
Adipate	•	•	•	•	•
Suberate	•	•	•	•	•
Ethylmalonate				•	•
Carbohydrate Metabolism					
Pyruvate	•	•	•	•	•
Lactic Acid	•	•	•	•	•
a-Hydroxybutyrate	•	•	•	•	•
β-OH-β-Methylglutaric Acid		•	•	•	•
β-OH-Butyric Acid (BHBA)	•	•	•		
Energy Production (Citric Acid Cycle)					
Citrate	•	•	•	•	•
cis-Aconitate	•	•	•	•	•
Isocitrate	•	•	•	•	•
a-Ketoglutarate	•	•	•	•	•
Succinate	•	•	•	•	•
Fumarate				•	•
Malate	•	•	•	•	•
Hydroxymethylglutarate				•	•
B-Complex Vitamin Markers					
a-Ketoadipic Acid	•	•	•		
a-Ketoisovalerate	•	•	•	•	•
a-Ketoisocaproate	•	•	•	•	•
a-Keto-ß-Methylvalerate	•	•	•	•	•
Xanthurenate	•	•	•	•	•
ß-Hydroxyisovalerate				•	•
Glutaric Acid	•	•	•		
3-Hydroxypropionic Acid	•	•	•		
Isovalerylglycine	•	•	•		
3-Hydroxyisovaleric Acid	•	•	•	•	
Methylation Cofactor Markers					
Methylmalonate	•	•	•	•	•
Formiminoglutamate	•	•	•	•	•
Neurotransmitter Metabolism Markers					
Vanilmandelate	•	•	•	•	•
Homovanillate	•	•	•	•	•
5-Hydroxyindoleacetate	•	•	•	•	•
Kynurenate	•	•	•	•	•
Quinolinate	•	•	•	•	•
Kynurenic / Quinolinic Ratio	•	•	•		
3-Methyl-4-OH-phenylglycol	•	•	•		
Picolinate				•	•
Oxidative Damage and Antioxidant Markers					
p-Hydroxyphenyllactate				•	•

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Organic Acids					
Toxicants and Detoxification					
a-Ketophenylacetic Acid	•	•	•		
a-Hydroxyisobutyric Acid	•	•	•		
2-Methylhippurate				•	•
Orotate	•	•	•	•	•
Glucarate				•	•
Pyroglutamate	•	•	•	•	•
Sulfate				•	•
Malabsorption Markers					
Indoleacetic Acid	•	•	•		
Phenylacetate	•	•	•	•	•
Dysbiosis Markers					
Benzoate	•	•	•	•	•
Hippurate	•	•	•	•	•
Dihydroxyphenylpropionic Acid	•	•	•		
3-Hyroxyproprionic Acid	•	•	•		
4-Hydroxyphenylpyruvic Acid	•	•	•		
Phenylpropionate				•	•
p-Hydroxybenzoate				•	•
p-Hydroxyphenylacetate				•	•
Indican				•	•
Tricarballylate				•	•
D-Lactate				•	•
3,4 Dihydroxyphenylpropionate				•	•
Yeast/Fungal Dysbiosis Markers					
D-Arabinitol	•	•	•	•	•
Citramalic Acid	•	•	•		
Tartaric Acid	•	•	•		
Oxidative Stress					
Coenzyme Q10	•	•		•	•
Alpha tocopherol				•	•
Gamma tocopherol				•	•
Vitamin A				•	•
ß-Carotene				•	•
Lipid Peroxides	•	•	•	•	•
Glutathione	•	•			
8-Hydroxy-2'-deoxyguanosine	•	•	•	•	•

Biomarkers Reported	NE PLS* 3001	NE FMV*	META+* 3200	ION 3100	ION AA40 3102
Fatty Acids					
Omega-3					
Alpha-Linolenic Acid (ALA)	•	•	+	•	•
Docosahexaenoic Acid (DHA)	•	•	+	•	•
Docosapentaenoic Acid	•	•	+	•	•
Eicosapentaenoic Acid (EPA)	•	•	+	•	•
% Omega-3s	•	•	+		
Omega-6					
Arachidonic Acid	•	•	+	•	•
Dihomogamma Linolenic Acid (DGLA)	•	•	+	•	•
Docasadienoic Acid				•	•
Docosatetraenoic Acid	•	•	+	•	•
Eicosadienoic Acid	•	•	+	•	•
Gamma Linolenic Acid (GLA)	•	•	+	•	•
Linoleic Acid (LA)	•	•	+	•	•
% Omega-6s	•	•	+		
Omega-9					
Mead Acid				•	•
% Omega-9s	•	•	+		
Nervonic Acid	•	•	+	•	•
Oleic Acid	•	•	+	•	•
Monounsaturated					
11-Eicosenoic Acid				•	•
Myristoleic Acid				•	•
Palmitoleic Acid	•	•	+	•	•
Vaccenic Acid	•	•	+	•	•
Saturated					
Arachidic Acid	•	•	+	•	•
Behenic Acid	•	•	+	•	•
Capric Acid				•	•
Hexacosanoic Acid				•	•
Lauric Acid				•	•
Lignoceric Acid	•	•	+	•	•
Margaric Acid	•	•	+		
Myristic Acid				•	•
Palmitic Acid	•	•	+	•	•
Stearic Acid	•	•	+	•	•
% Saturated Fats	•	•	+		

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Fatty Acids					
Odd Chain					
Heneicosanoic Acid				•	•
Heptadecanoic Acid				•	•
Nonadecanoic Acid				•	•
Pentadecanoic Acid	•	•	+	•	•
Tricosanoic Acid	•	•	+	•	•
Trans					
Elaidic Acid	•	•	+		
Palmitelaidic Acid				•	•
Total C:18 Trans				•	•
Ratios (calculated)/Various					
LA/DGLA				•	•
EPA/DGLA				•	•
AA/EPA	•	•	+	•	•
Triene/Tetraene				•	•
Omega-6s/ Omega-3s	•	•	+		
Omega-3 Index	•	•	+		
Nutrient and Toxic Elements					
Nutrient Elements					
Calcium			+	•	•
Chromium			+		
Cobalt			+		
Copper	•	•	+	•	•
Iron			+		
Lithium			+		
Magnesium	•	•	+	•	•
Manganese	•	•	+		
Molybdenum			+		
Potassium	•	•	+	•	•
Selenium	•	•	+	•	•
Strontium			+		
Sulfur			+		
Vanadium			+		
Zinc	•	•	+	•	•
Toxic Elements					
Lead*	•	•	+	•	•
Mercury	•	•	+	•	•
Aluminum			+	•	•
Antimony			+		
Arsenic	•	•	+	•	•
Barium			+		
Bismuth			+		
Cadmium	•	•	+	•	•
Cesium			+		

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Toxic Elements					
Gadolinium			+		
Gallium			+		
Nickel			+		
Niobium			+		
Platinum			+		
Rubidium			+		
Thallium			+		
Thorium			+		
Tin			+		
Tungsten			+		
Uranium			+		
Add-ons					
SNP - APO E (C112R + R158C)	+	+	+		
SNP - MTHFR Combined (A1298C + C677T)	+	+	+		
SNP - TNFA	+	+	+		
SNP - COMT (V158M)	+	+	+		
Serum Chemistries				+	+
Vitamin D	+	+		•	•

GENOVA DIAGNOSTICS®

www.gdx.net

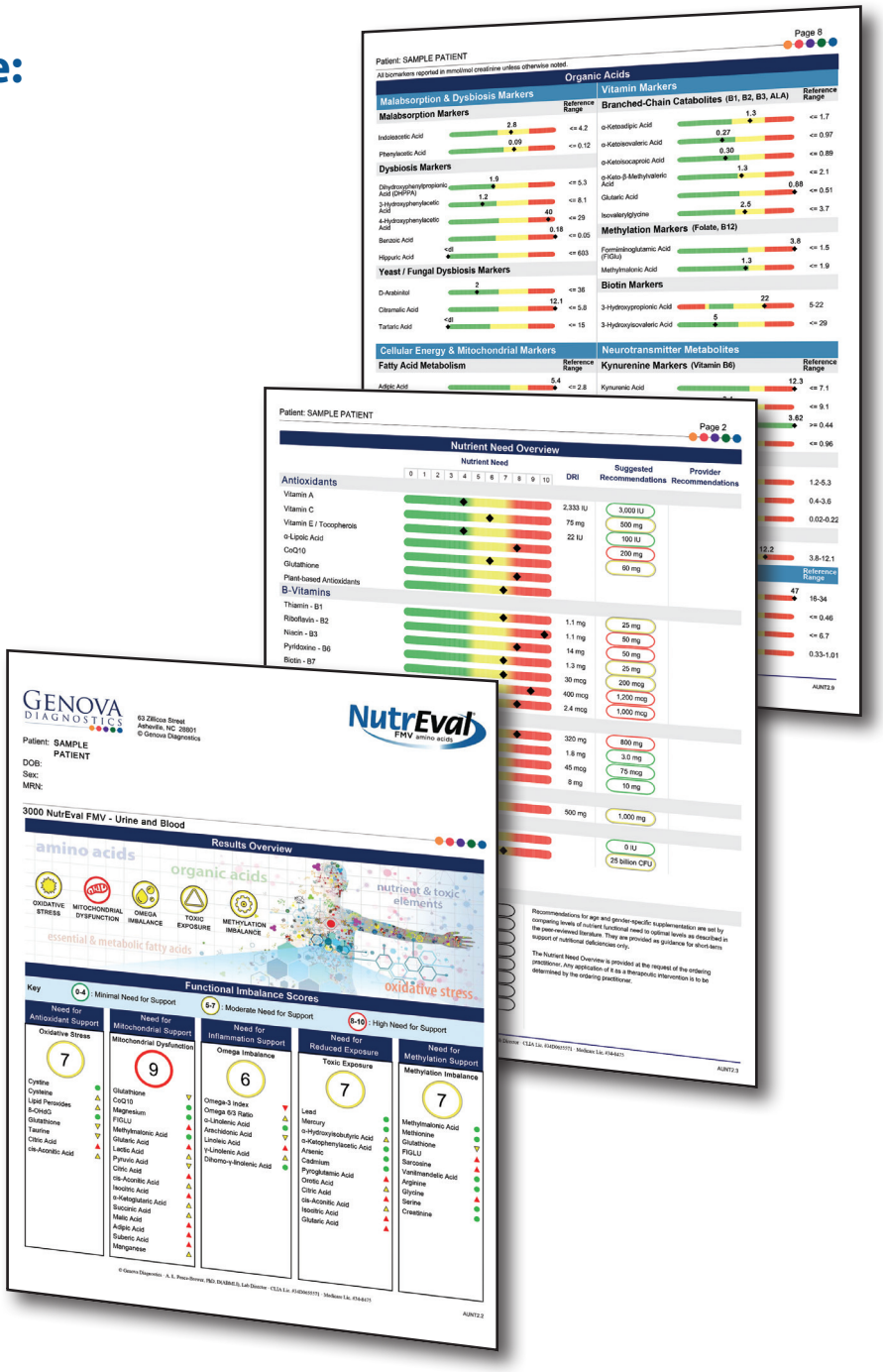
Genova's standard-setting report design

Our report synthesizes complex biochemistry into actionable treatment options. Our rigorous testing analyzes a wide array of biomarkers and combines those results using an algorithm that considers the complex interrelation of a patient's individual chemistry.

The report combines the results into specific recommendations personalized for each patient.

Our nutrition reports feature:

- Synthesized and actionable areas of high need for supplementation
- Dynamic biochemical pathway charts for clearer understanding
- Suggested personalized supplement schedule which provides personalized recommendations for antioxidants, B-vitamins, minerals, essential fatty acids, digestive support, and amino acids
- Easy-to-use "Interpretation At-A-Glance" that provides patients valuable information about the function of individual nutrients, causes and complications of their deficiencies, and their dietary sources



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