

Ordering Physician:

Metamatrix

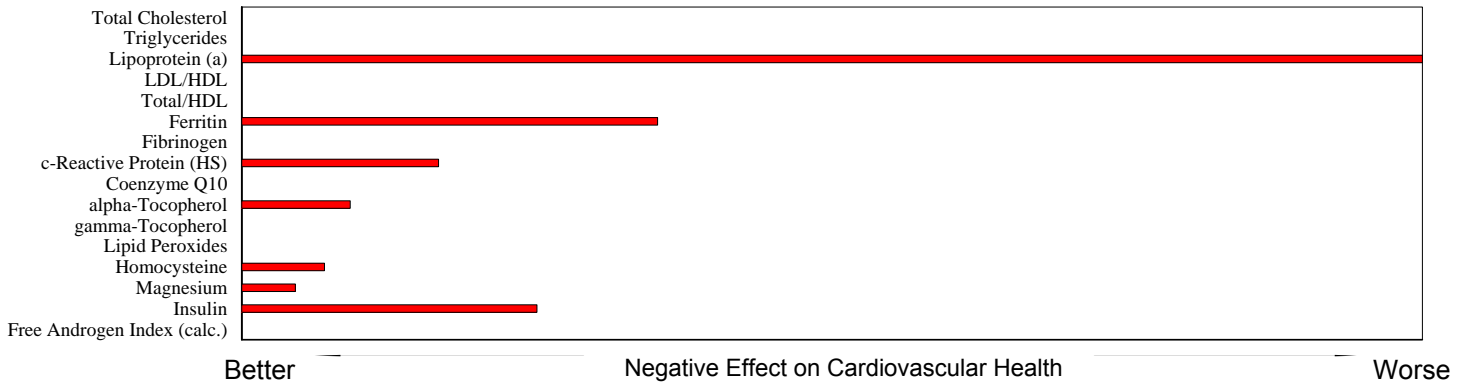
3425 Corporate Way  
Duluth, GA 30096

*Accession Number:* **A0812100020**  
*Reference Number:*  
*Patient:* **Sample Report**  
*Age:* 46 *Sex:* Female  
*Date of Birth:* 02/05/1962  
*Date Collected:* 12/9/08  
*Date Received:* 12/10/08  
*Report Date:* 12/10/08  
*Telephone:* (770) 446-4583  
*Fax:* (770) 441-2237  
*Reprinted:* 1/15/09  
*Comment:*

### **0290 Cardio/ION Profile**

Reference ranges have been changed for amino acids, minerals, toxic elements and some organix analytes due to a review of our patient population. Reference ranges have been changed for vitamin A due to method improvements.





Most of the nutritional and metabolic measurements included in the Cardio/ION profile are associated to some degree with your cardiovascular health. However, those shown on the previous page of this report are ones that most strongly and specifically affect your cardiovascular health. Some factors are favorable for cardiac health when they are high, while others should be low. The chart above helps you to see where the most significant abnormalities are; the longest bars on the chart show the most abnormal results on a scale of increasing negative effects on cardiovascular health.

The "Cardiovascular Index" chart below shows your test results with all of the factors summarized as a single index. Depending on your results, some steps that your doctor may want you to take to improve your cardiovascular health are shown in the tables of recommendations at the end of these pages. It is important that you follow your doctor's instructions to achieve the lowest index.

**Cardiovascular Index = 4.4**



- These guidelines are intended as a starting point for the clinician who requested the test and are based only on the laboratory results included in this report. Final recommendations should be implemented by the clinician with consideration of medical history and current clinical observations.
- These tests are not intended for the diagnosis of specific disorders.

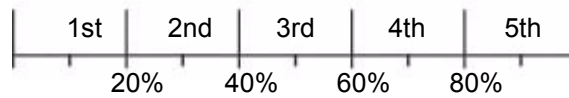
**Amino Acid Analysis - 20 Plasma**

Methodology: ION Exchange HPLC

Ranges are for ages 13 and over.

Results  
umol/L

**Percentile Ranking by Quintile**



**95%  
Reference  
Interval**

Essential Amino Acids

Rank	Amino Acid	Result (umol/L)	Flag	Percentile	95% Reference Interval
1	Arginine	31	L	58	35 - 115
2	Histidine	54		51	38 - 82
3	Isoleucine	58		45	30 - 82
4	Leucine	113		84	60 - 143
5	Lysine	90	L	133	98 - 218
6	Methionine	11	L	18	13 - 29
7	Phenylalanine	43	L	45	36 - 67
8	Threonine	65	L	83	49 - 165
9	Tryptophan	39	L	40	29 - 64
10	Valine	238		150	104 - 262

Essential Amino Acid Derivatives

Neuroendocrine Metabolism

Rank	Amino Acid	Result (umol/L)	Flag	Percentile	95% Reference Interval
11	Glycine	97	L	187	96 - 397
12	Serine	80		78	54 - 136
13	Taurine	44		37	8 - 92
14	Tyrosine	37	L	42	31 - 85

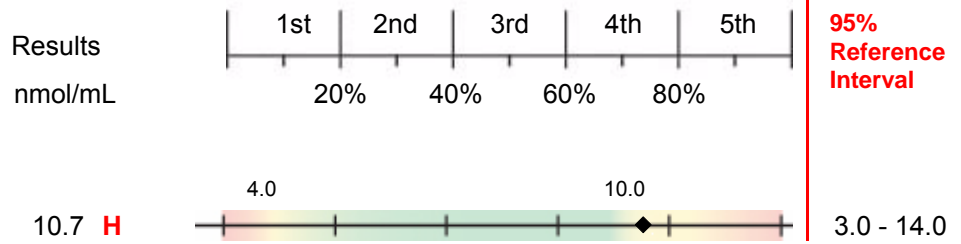
Ammonia/Energy Metabolism

Rank	Amino Acid	Result (umol/L)	Flag	Percentile	95% Reference Interval
15	Asparagine	24	L	34	24 - 56
16	Aspartic Acid	6.0		5.1	3.5 - 11.7
17	Citrulline	20	L	24	16 - 45
18	Glutamic Acid	35		35	25 - 155
19	Glutamine	428	L	435	343 - 637
20	Ornithine	37	L	43	19 - 101

**Homocysteine**

Methodology: Competitive Immunoassay

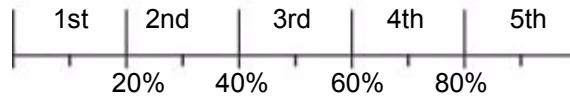
**Percentile Ranking by Quintile**



**Element - Erythrocytes and Whole Blood**

Methodology: Inductively Coupled Plasma /Mass Spectroscopy

**Percentile Ranking by Quintile**



95%  
Reference  
Interval

Results

Reference Limits

Nutrient Elements

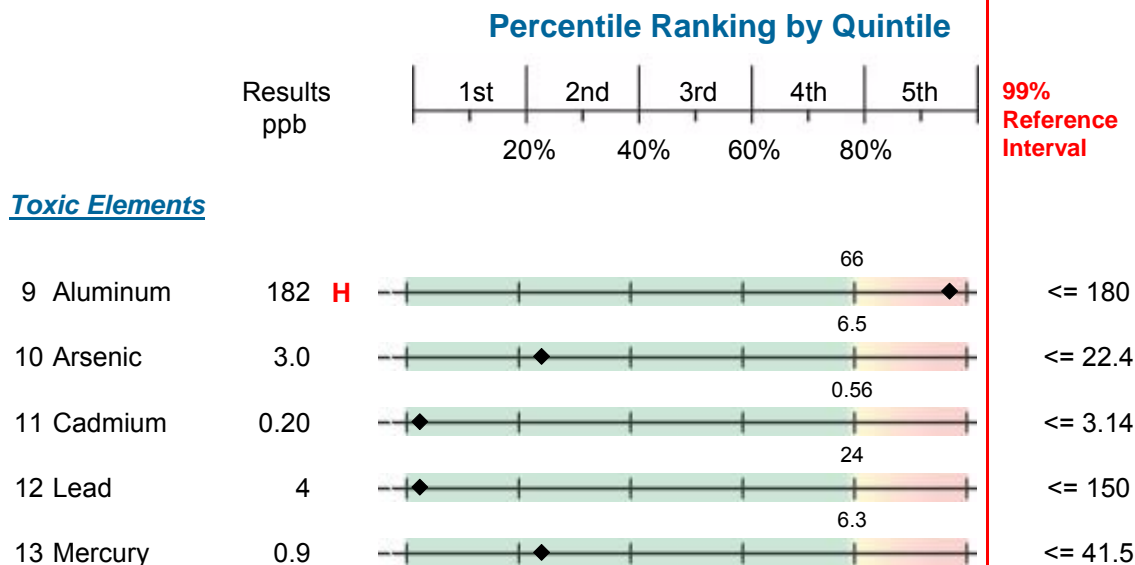
Element	Value	Percentile	Reference Range	Units
1 Potassium	2,154	1,421	1,012 - 2,199	ppm packed cells
2 Magnesium *	21 L	22	16 - 32	ppm packed cells
3 Zinc	5.5	4.5	3.3 - 7.7	ppm packed cells
4 Copper	343	306	257 - 500	ppb packed cells
5 Manganese	26	24	19 - 41	ppb packed cells
6 Chromium	1.4 L	2.2	1.4 - 7.9	ppb packed cells
7 Selenium	0.19	0.19	0.14 - 0.47	ppm whole blood
8 Calcium	15	29	10 - 43	ppm packed cells

Relevant to membrane permeability, not nutritional status.

\*The expanded abnormal range approximates the population at risk for magnesium insufficiency disorders. See: Johnson S, Med Hypotheses. Feb 2001;56(2):163-170.

**Element - Erythrocytes and Whole Blood**

Methodology: Inductively Coupled Plasma /Mass Spectroscopy



Results for whole blood toxic elements that are within normal limits do not rule out metal accumulation in other tissues. This can be evaluated by urinary porphyrin or 24-hour urine chelation challenge tests.

**Lead Levels Considered Elevated in Adults (1)**

- ◆ At levels above 800 ppb, serious, permanent health damage may occur (extremely dangerous).
- ◆ Between 400 and 800 ppb, serious health damage may be occurring, even if there are no symptoms (seriously elevated).
- ◆ Between 250 and 400 ppb, regular exposure is occurring. There is some evidence of potential physiological problems (elevated).
- ◆ Between 100 and 250 ppb, lead is building up in the body and exposure is occurring.

In children, lead levels even below 100 ppb are associated with IQ deficits.(2), and, in adults, levels as low as 50-90 ppb cause an increased risk of death from all causes, cardiovascular disease and cancer.(3)

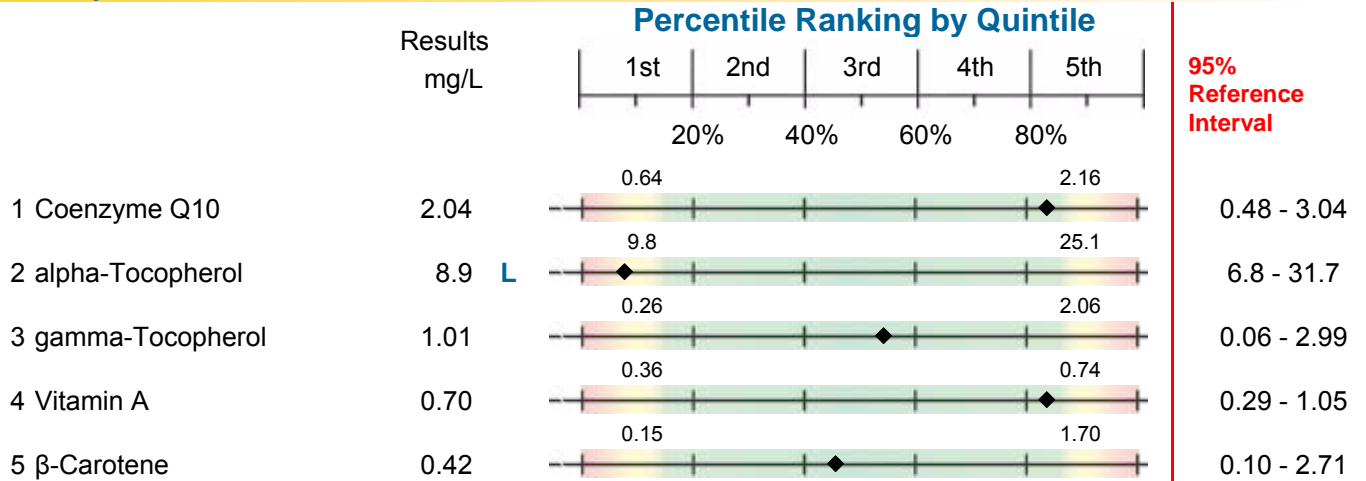
(1)Lead Exposure in Adults. A Guide for Health Care Providers, State of New York, Department of Public Health.

(2) Lanphear BP, Hornung R, Khoury J, et al. Low-level environmental lead exposure and children's intellectual function: an international pooled analysis. Environ Health Perspect. Jul 2005;113(7):894-899.

(3) Schober, Susan et al. Blood Lead Levels and Death from All Causes, Cardiovascular Disease, and Cancer: Results from the NHANES III Mortality Study. Environmental Health Perspect. Oct 2006; 114(10):1538-1541.

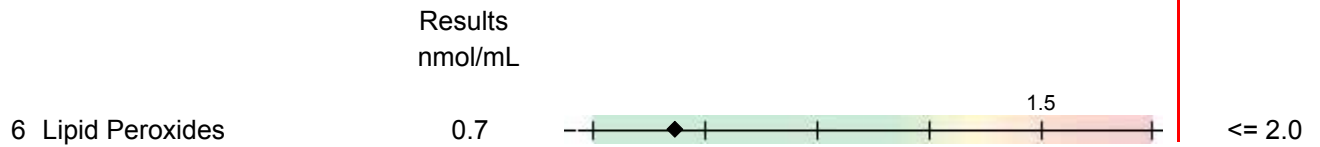
**CoEnzyme Q10 Plus Vitamin Panel - Serum**

Methodology: High Performance Liquid Chromatography



**Lipid Peroxide - Serum**

Methodology: High Performance Liquid Chromatography



**8-Hydroxy-2 deoxyguanosine - Urine**

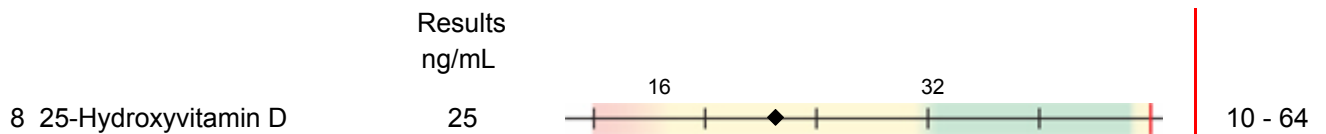
Methodology: LC/Tandem Mass Spectroscopy, Colorimetric

Ranges are for ages 13 and over.



**Vitamin D - Serum**

Methodology: Chemiluminescent immunoassay (CLIA)



Levels of 25-hydroxyvitamin D that fall below 20 ng/mL (50 nmol/L) reflect frank vitamin D deficiency. Studies based on functional markers have identified levels below 30 ng/mL (75 nmol/L) as hypovitaminosis D where stores are depleted and PTH levels may begin to rise. Optimal values lie in the 30-60 ng/ml range (4th and 5th quintiles) for the Metamatrix reference population that comes largely from North America. Extremely high levels may be toxic.

- Holick MF. Vitamin D deficiency. *N Engl J Med.* 2007;357(3):266-281.
- Hollis BW. Circulating 25-hydroxyvitamin D levels indicative of vitamin D sufficiency: implications for establishing a new effective dietary intake recommendation for vitamin D. *J Nutr.* Feb 2005;135(2):317-322.

Conversion factors: nmol/L = ng/mL x 2.5 | ng/mL = nmol/L x 0.4

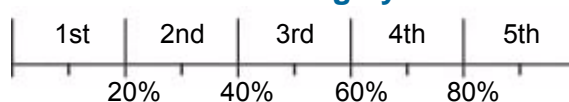
**Fatty Acids - Plasma**

Methodology: Capillary Gas Chromatography/Mass Spectrometry

Ranges are for ages 13 and over.

Results  
uM

**Percentile Ranking by Quintile**



**95%  
Reference  
Interval**

**Polyunsaturated Omega-3**

1	Alpha Linolenic (18:3n3)	35	L	37	22 - 144
2	Eicosapentaenoic (20:5n3)	33	L	44	19 - 362
3	Docosapentaenoic (22:5n3)	119	H	46	31 - 112
4	Docosahexaenoic (22:6n3)	135	L	172	95 - 333

**Polyunsaturated Omega-6**

5	Linoleic (18:2n6)	2,268		1,571 - 2,807	1,305 - 3,300
6	Gamma Linolenic (18:3n6)	22.2		8.9 - 38.1	5.2 - 58.0
7	Eicosadienoic (20:2n6)	19		18 - 37	14 - 45
8	Dihomogamma Linolenic (20:3n6)	106		88 - 225	64 - 294
9	Arachidonic (20:4n6)	725	H	330 - 633	260 - 750
10	Docosadienoic (22:2n6)	2.4		1.2 - 2.9	0.9 - 3.8
11	Docosatetraenoic (22:4n6)	26		11 - 38	7 - 51

**Polyunsaturated Omega-9**

12	Mead (20:3n9)	7.3		0.6 - 10.2	0.5 - 13.2
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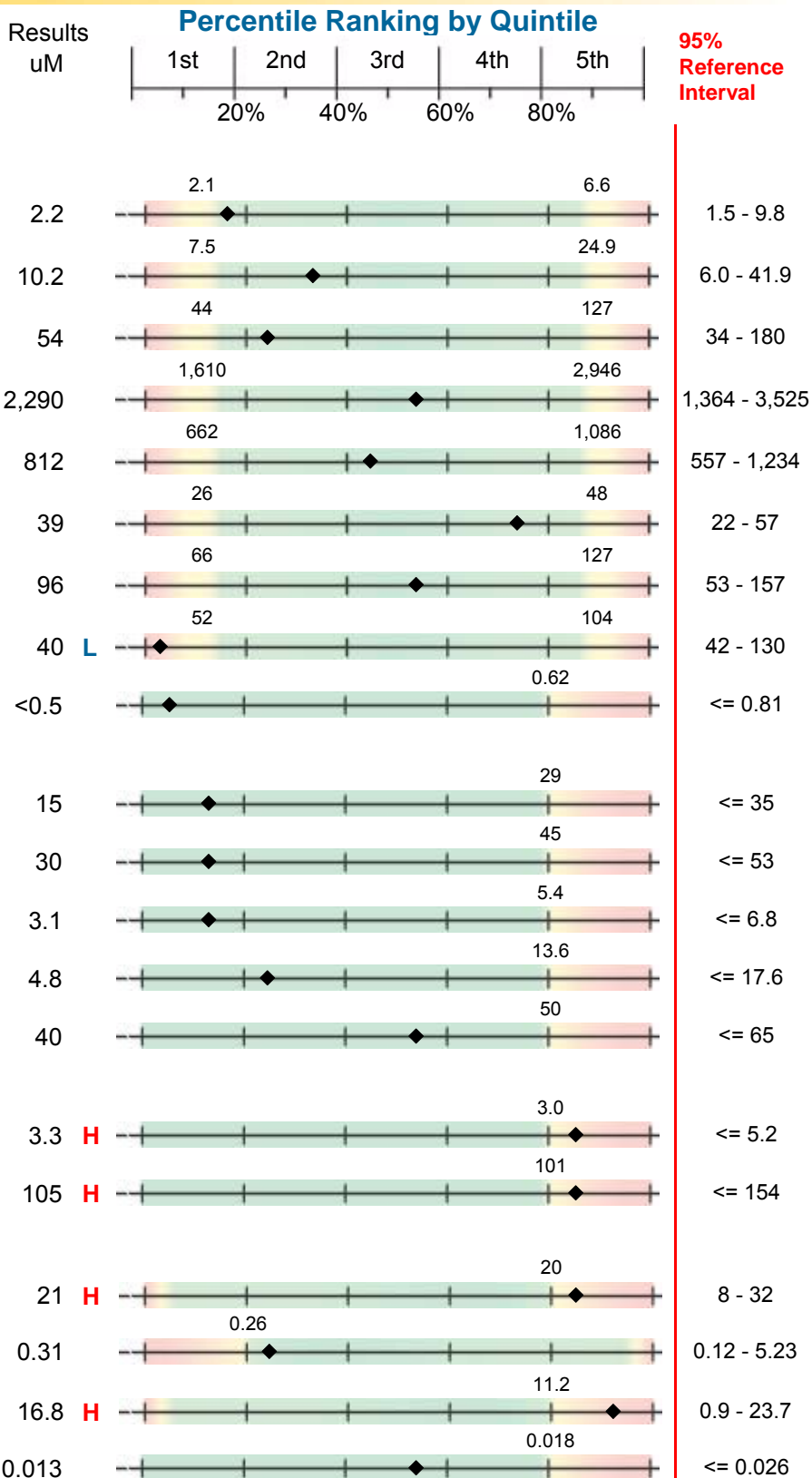
**Monounsaturated**

13	Myristoleic (14:1n5)	2.3		6.9	<= 11.6
14	Palmitoleic (16:1n7)	82		155	<= 238
15	Vaccenic (18:1n7)	120		87 - 175	74 - 209
16	Oleic (18:1n9)	1,891		1,079 - 2,733	1,079 - 2,800
17	11-Eicosenoic (20:1n9)	11.3		10.2 - 22.6	8.4 - 29.5
18	Erucic (22:1n9)	5.1		3.6 - 6.8	2.8 - 8.1
19	Nervonic (24:1n9)	78	L	86 - 161	70 - 189

**Fatty Acids - Plasma**

Methodology: Capillary Gas Chromatography/Mass Spectrometry

Ranges are for ages 13 and over.

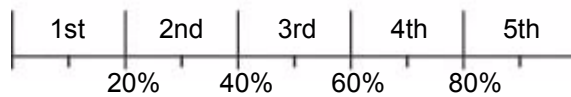


**Organix™ Comprehensive - Urine**

Methodology: LC/Tandem Mass Spectroscopy, Colorimetric

Results are expressed as mcg/mg creatinine.  
Ranges are for ages 13 and over.

**Percentile Ranking by Quintile**



**95%  
Reference  
Interval**

**NUTRIENT MARKERS**

Results

Fatty Acid Metabolism

(Carnitine & B2)

1 Adipate	1.2	7.3	<= 11.7
2 Suberate	1.4	2.0	<= 3.7
3 Ethylmalonate	0.4	3.5	<= 6.3

Carbohydrate Metabolism

(B1, B3, Cr, Lipoic Acid, CoQ10)

4 Pyruvate	5.1 H	4.2	<= 7.1
5 L-Lactate	2 L	14	3 - 47
6 β-Hydroxybutyrate	<DL*	2.7	<= 9.7

Energy Production (Citric Acid Cycle)

(B comp., Q10, Amino acids, Mg)

7 Citrate	92	622	44 - 1,032
8 Cis-Aconitate	8 L	54	16 - 86
9 Isocitrate	18 L	105	43 - 157
10 α-Ketoglutarate	24 H	22	<= 38
11 Succinate	2.5	12.5	<= 25.7
12 Fumarate	<DL*	0.69	<= 1.69
13 Malate	0.2	1.4	<= 3.2
14 Hydroxymethylglutarate	0.9	4.2	<= 6.0

B-Complex Vitamin Markers

(B1, B2, B3, B5, B6, Biotin)

15 α-Ketoisovalerate	0.00	0.37	<= 0.69
16 α-Ketoisocaproate	0.00	0.45	<= 0.71
17 α-Keto-β-Methylvalerate	0.00	0.31	<= 0.86
18 Xanthurenate	0.12	0.89	<= 1.34
19 β-Hydroxyisovalerate	2.4	8.2	<= 11.7

Methylation Cofactor Markers

(B12, Folate)

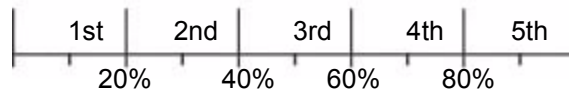
20 Methylmalonate	0.2	1.7	<= 2.4
21 Formiminoglutamate	0.38	1.67	<= 2.94

**Organix™ Comprehensive - Urine**

Methodology: LC/Tandem Mass Spectroscopy, Colorimetric

Ranges are for ages 13 and over.

**Percentile Ranking by Quintile**



**95%  
Reference  
Interval**

**CELL REGULATION MARKERS**

Neurotransmitter Metabolism Markers

(Tyrosine, Tryptophan, B6, antioxidants)

22	Vanilmandelate	0.7	L	1.7	4.5	1.2 - 6.0
23	Homovanillate	0.7	L	2.0	7.2	1.2 - 13.9
24	5-Hydroxyindoleacetate	2.9		1.6	8.1	0.9 - 50.8
25	Kynurenate	3.2	H		2.8	<= 4.4
26	Quinolate	3.3			3.7	<= 5.2
27	Picolinate	1.6	L		8.5	3.1 - 15.0

Oxidative Damage and Antioxidant Markers

(Vitamin C and other antioxidants)

28	p-Hydroxyphenyllactate	0.15			1.09	<= 2.14
29	8-Hydroxy-2-deoxyguanosine *	5.1			5.3	<= 7.6

\* Units for 8-Hydroxy-2-deoxyguanosine are ng/mg creatinine.

**TOXICANTS AND DETOXIFICATION**

Detoxification Indicators

(Arg, NAC, Met, Mg and antioxidants)

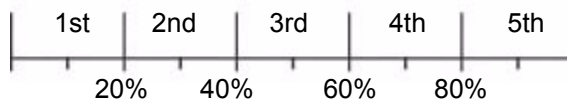
30	2-Methylhippurate	0.027			0.039	<= 0.073
31	Orotate	0.3			0.8	<= 1.4
32	Glucarate	3.7			8.1	<= 14.5
33	a-Hydroxybutyrate	0.3			0.4	<= 1.4
34	Pyroglutamate	66	H		51	<= 85
35	Sulfate	865	L	986	2,353	762 - 2,778

**Organix™ Comprehensive - Urine**

Methodology: LC/Tandem Mass Spectroscopy, Colorimetric

Ranges are for ages 13 and over.

**Percentile Ranking by Quintile**



**COMPOUNDS OF BACTERIAL OR YEAST/FUNGAL ORIGIN**

Bacterial - general

Compound	Value	Reference Range	Percentile
36 Benzoate	<DL*	<= 27.6	~85%
37 Hippurate	602 <b>H</b>	<= 1,102	~95%
38 Phenylacetate	<DL*	<= 0.29	~85%
39 Phenylpropionate	<DL*	<= 0.4	~85%
40 p-Hydroxybenzoate	0.1	<= 2.9	~25%
41 p-Hydroxyphenylacetate	25 <b>H</b>	<= 40	~90%
42 Indican	21	<= 120	~25%
43 Tricarballoylate	0.42	<= 1.55	~55%

L. acidophilus / general bacterial

44 D-Lactate	0.6	<= 6.5	~25%
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Clostridial species

45 3,4-Dihydroxyphenylpropionate	<DL*	<= 0.12	~85%
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Yeast / Fungal

46 D-Arabinitol	36 <b>H</b>	<= 59	~90%
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Creatinine = 205 mg/dL

\* <DL = less than detection limit

These test results in this report are not for the diagnosis of disease. They are intended to provide nutritional guidelines to qualified healthcare professionals with full knowledge of patient history and concerns to assist in their design of an appropriate healthcare program.

A multi-analyte report can provide greater insight about health risks and special nutrient needs. Patterns of abnormalities can reinforce the degree of significance indicated by a single measurement. Analytes from the various profiles in the ION report are combined below into categories associated with clinical/metabolic conditions.

The categories included cover the most common areas of concern relevant to these profiles. Above each thermometer are listed the analytes used to calculate the *degree of significance*. An H or L appears when the patient result is in the fifth quintile (80%) of the population. An additional **X** next to an analyte indicates that the patient result is outside the 95% reference interval for that analyte.

The thermometer advances to the right as the number and severity of relevant abnormalities increases. The longer the filled bar, the greater the degree of significance or likelihood that a health threat may exist in that category. The preceding laboratory reports provide the detail upon which these thermometers are based.

## Cardiovascular System

Arginine	<b>X</b>	L	Homocysteine	H	Calcium		Magnesium	L
CoQ10			a-Tocopherol	L	Lipid Peroxide		8-OHdG	
AA/EPA		H						



Low significance

High significance

## Fatigue

Isoleucine			Leucine		Phenylalanine	L	Valine
Magnesium	L		CoQ10		Adipate		Suberate
AKG		H	Succinate		Malate		Xanthurenate
MeMalonate			FIGLU				

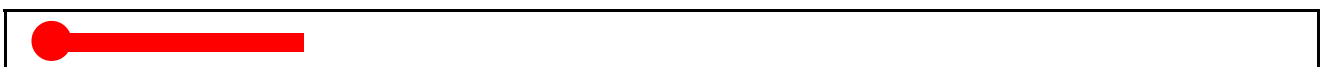


Low significance

High significance

## Metabolic Syndrome (Syndrome X)

Chromium	L		Magnesium	L	Zinc		Palmitic
Stearic			AHB		BHB		BHiVal

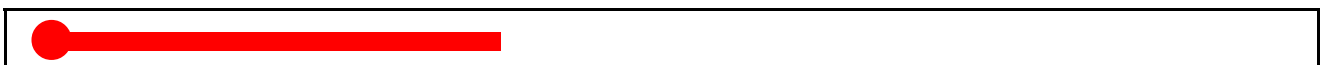


Low significance

High significance

## Mental/Emotional

Tryptophan	L		Tyrosine	L	Magnesium	L	EPA	L
DHA	L		Xanthurenate		MeMalonate		FIGLU	
VMA		<b>X</b>	5-HIA					



Low significance

High significance

## Intestinal Bacterial Metabolites

PhAc	PhProp	pOHBenz	pOHPhAc	H
Indican	Tricarb	D-Lactate	3,4-DHPP	



Low significance

High significance

## Intestinal Yeasts / Fungal Metabolites

D-Arabinitol H



Low significance

High significance

## Digestion/Absorption

Arginine	X L	Histidine		Isoleucine		Leucine	
Lysine	X L	Methionine	X L	Phenylalanine	L	Threonine	L
Tryptophan	L	Valine		Chromium	L	Copper	
Manganese		Selenium		Zinc			



Low significance

High significance

## Toxic Exposure

Aluminum	X H	Cadmium		Lead		Mercury	
Palmitelaidic	H	C18TrFa	H	Citrate		Cis-Aconitate	
Isocitrate		Quinolate		2-MeHipp		Orotate	
Glucarate							



Low significance

High significance

## Detoxification Impairment

Methionine	X L	Glycine	L	Serine		Taurine	
Glutamine	L	Pyroglutamate	H	Sulfate	L	Benzoate	



Low significance

High significance

## Oxidative Stress/Antioxidant Insufficiency

Taurine	Copper	Manganese	Selenium
Zinc	Lead	Mercury	a-Tocopherol L
g-Tocopherol	Vitamin A	b-Carotene	Lipid Peroxide
8-OHdG	pOHPHac	Sulfate L	

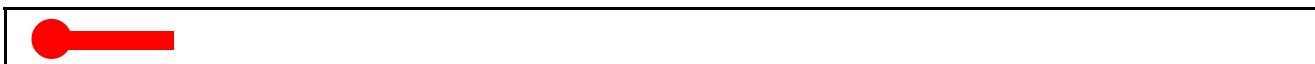


Low significance

High significance

## Mitochondrial Functional Impairment

Magnesium L	CoQ10	Adipate	Suberate
Ethylmalonate	Pyruvate H	L-Lactate	AHB
BHB	Succinate	Fumarate	Malate



Low significance

High significance

## Amino Acid Insufficiency

Arginine X L	Histidine	Isoleucine	Leucine
Lysine X L	Methionine X L	Phenylalanine L	Threonine L
Tryptophan L	Valine	AKG H	Succinate
Sulfate L			



Low significance

High significance

## Essential Fatty Acid Insufficiency

ALA L	EPA L	DHA L	LA
GLA	DGLA	Palmitoleic	Mead
Triene/Tetraer			



Low significance

High significance

## Disordered Methyl Group (Single carbon) Transfer

Homocysteine H	Pentadeca	Heptadeca	Nonadecanoic
Tricosanoic	Xanthurenate	MeMalonate	FIGLU
Kynurenate H			



Low significance

High significance

## Disordered Tryptophan Metabolism

Tryptophan	L	Xanthurenate	5-HIA	Kynurenate	H
Quinolinate		Indican			



Low significance

High significance

<u>Abbreviation</u>	<u>Analyte Name</u>	<u>Abbreviation</u>	<u>Analyte Name</u>
2-MeHipp	2-Methylhippurate	FIGLU	Formiminoglutamate
5-HIA	5-Hydroxyindoleacetate	g-Tocopherol	gamma-Tocopherol
8-OhdG	8-Hydroxy-2-deoxyguanosine	GLA	Gamma Linoleic (18:3n6)
AA/EPA	Arachidonic (20:4n6)/Eicosapentaenoic (20:5n3)	Heptadeca	Heptadecanoic (17:0)
AHB	a-Hydroxybutyrate	Hcys	Homocysteine
AKG	a-ketoglutarate	HVA	Homovanillate
aKbMeVal	a-Keto-β-Methylvalerate	HMG	Hydroxymethylglutarate
aKiCap	a-Ketoisocaproate	LA	Linoleic (18:2n6)
aKiVal	a-Ketoisovalerate	MeMalonate	Methylmalonate
ALA	Alpha Linolenic (18:3n3)	Pentadeca	Pentadecanoic (15:0)
a-Tocopherol	alpha-Tocopherol	PhAc	Phenylacetate
BHB	β-Hydroxybutyrate	PhProp	Phenylpropionate
BHiVal	β-Hydroxyisovalerate	pHBenz	p-Hydroxybenzoate
C18TrFa	Total C:18 Trans	pHPhAc	p-Hydroxyphenylacetate
CoQ10	Coenzyme Q10	pHPhLac	p-Hydroxyphenyllactate
DGLA	Dihomogamma Linolenic (20:3n6)	Total C:18	Total c:18 Trans
DHA	Docosahexanoic (22:6n3)	Tricarb	Tricarallylate
3,4-DHPP	3,4-Dihydroxyphenylpropionate	Triene/Tetraene	Mead/Arachidonic Ratio
EPA	Eicosapentaenoic (20:5n3)	VMA	Vanilmandelate

## Supplement Recommendation Summary

With knowledge of a patient's full medical history and concerns, the ION Profile laboratory results may be used to help create an individually optimized nutritional support program. Based strictly on the results from this test, the summary table below shows estimates of nutrient doses that may help to normalize nutrient-dependent metabolic functions. All amounts are adult doses that should be reduced for children according to body weight.

### Customized Vitamin and Mineral Formulation

Nutrients listed in this section are normally contained in a multi-vitamin preparation. "Base" amounts may be used for insurance of health even when no abnormalities are found.

Customized preparations of the multi-vitamin/mineral formula shown below may be produced by compounding pharmacies. If such a product is made according to these specifications each dose should be thoroughly stirred into a few ounces of water or diluted fruit juice to fully release carbonates and avoid stomach bloating effects.

	Daily Amounts	
	Base	Units Added
Vitamin A	2500 IU	
B-Carotene	5500 IU	
Vitamin C	250 mg	500 mg
Vitamin D	400 IU	200 IU
Vitamin E (Mixed Tocopherols)	100 IU	200 IU
Vitamin K*	100 mcg	
Thiamin (B1)	5 mg	20 mg
Riboflavin (B2)	5 mg	10 mg
Niacin (B3)	25 mg	20 mg
Pyridoxine (B6)	15 mg	60 mg
Folic Acid	400 mcg	
Vitamin B12	50 mcg	
Biotin	100 mcg	
Pantothenic Acid (B5)	25 mg	50 mg
Calcium	500 mg	500 mg
Iodine*	75 mcg	
Magnesium	250 mg	200 mg
Zinc	15 mg	15 mg
Selenium	100 mcg	50 mcg
Copper	1 mg	
Manganese	5 mg	
Chromium	200 mcg	200 mcg
Molybdenum*	25 mcg	
Boron*	1 mg	
Citric Acid*	200 mg	
Malic Acid*	200 mg	

\* Nutrients with an asterisk are not modified based on the ION test results.

MM02

**Other Items Indicated for individual supplementation**

Various conditionally essential nutrients and other potentially beneficial interventions appear in this section only if relevant abnormalities are present. These ingredients are not included in the customized vitamin formula on the previous page.

Amino acids listed on this page result from functional markers of individual amino acid insufficiency and do not reflect amino acids measured in plasma.

<b>Item</b>	<b>Amount</b>
<b>Potential to Benefit from Probiotics</b>	Moderate
<b>Antifungals</b>	As needed
<b>Coenzyme Q10</b>	30 mg
<b>Fish Oil</b>	6 gm
<b>Glycine</b>	4000 mg
<b>Lipoic Acid</b>	100 mg
<b>N-Acetylcysteine</b>	750 mg

## Customized Free-Form Amino Acids

The table below shows the recommended custom amino acid formula based on the results of your laboratory test for fasting plasma amino acid levels. The Base Formula contains a constant percentage of the essential amino acids. To achieve your optimal formula, additional amounts of individual amino acids ("Grams Added") are added and the "Base Formula amount" is adjusted to assure the total appropriate amount of powder. The final percentage in your powder will be different from those in the table because of the addition of specific amounts of each essential amino acid.

Directions: Adults mix 1 and 1/2 measuring teaspoon (5g) into juice or water 2 times daily between meals as a dietary supplement, or as directed by a health care practitioner. Children under 12 years old: 1 teaspoon 1-2 times daily between meals.

Base Formula amount:	216 gm	% of Base	Grams Added	mg per day
	5-Hydroxytryptophan*	0.00 % +	1	33
	Arginine	9.40 % +	20	1343
	Histidine	10.10 % +	0	727
	Isoleucine	9.40 % +	0	677
	Leucine	12.90 % +	0	929
	Lysine	9.40 % +	18	1277
	Methionine	7.70 % +	17	1121
	Phenylalanine	12.90 % +	3	1029
	Taurine	0.00 % +	10	333
	Threonine	8.10 % +	9	883
	Valine	11.10 % +	0	799
	Pyridoxal-5-phosphate	.3 % +	0	22
	Alpha-ketoglutaric acid	8.5 % +	0	612
	* ...or L-Tryptophan (Requires doctor's order)		5	167

Only the essential amino acids are included in this formula because from these all of the other amino acids can be formed, raising the levels of any that might be low. Pyridoxal-5-phosphate (an active form of B6) and alpha-ketoglutaric acid cofactor nutrients are key factors needed for the body's utilization of amino acids. The formula may be ordered as a powder that dissolves easily in beverages or may be added to foods such as applesauce. Other forms of supplemental dietary protein or amino acids may need to be restricted while using your customized formula. If enhanced energy levels prevent sleep, avoid bedtime use.

In addition to the above customized amino acid formula, this patient may benefit from further use of single amino acids, as evidenced by profiles other than plasma amino acids. See the category, "Other Indicated Nutrients" on your Supplement Recommendation Summary Page.