



Ordering Physician:

Metametrix

3425 Corporate Way
Duluth, GA 30096

Accession Number: **A0812100019**
Reference Number:
Patient: Sample Report
Age: 46 *Sex:* Male
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
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Reprinted: 1/15/09
Comment:

0090 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.

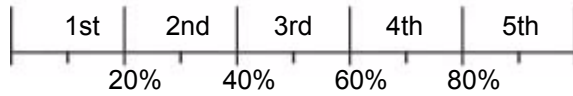
Amino Acid Analysis - 20 Plasma

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)	Reference Interval
1	Arginine	31 L	35 - 115
2	Histidine	54	38 - 82
3	Isoleucine	58	30 - 82
4	Leucine	113	60 - 143
5	Lysine	90 L	98 - 218
6	Methionine	11 L	13 - 29
7	Phenylalanine	46	36 - 67
8	Threonine	65 L	49 - 165
9	Tryptophan	39 L	29 - 64
10	Valine	238	104 - 262

Essential Amino Acid Derivatives

Neuroendocrine Metabolism

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

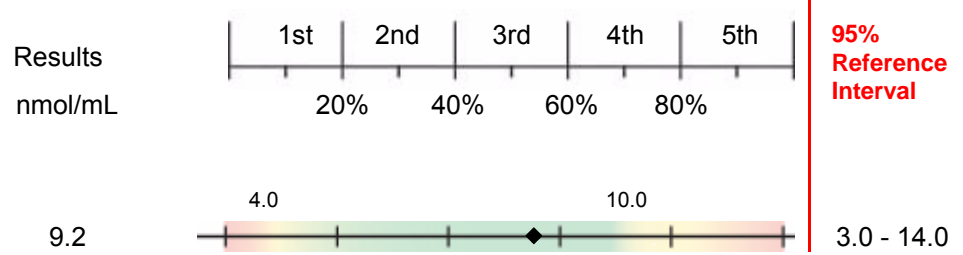
Ammonia/Energy Metabolism

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

Homocysteine

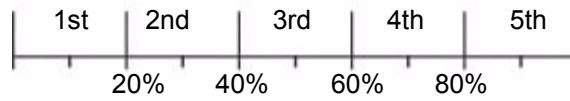
Methodology: Competitive Immunoassay

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

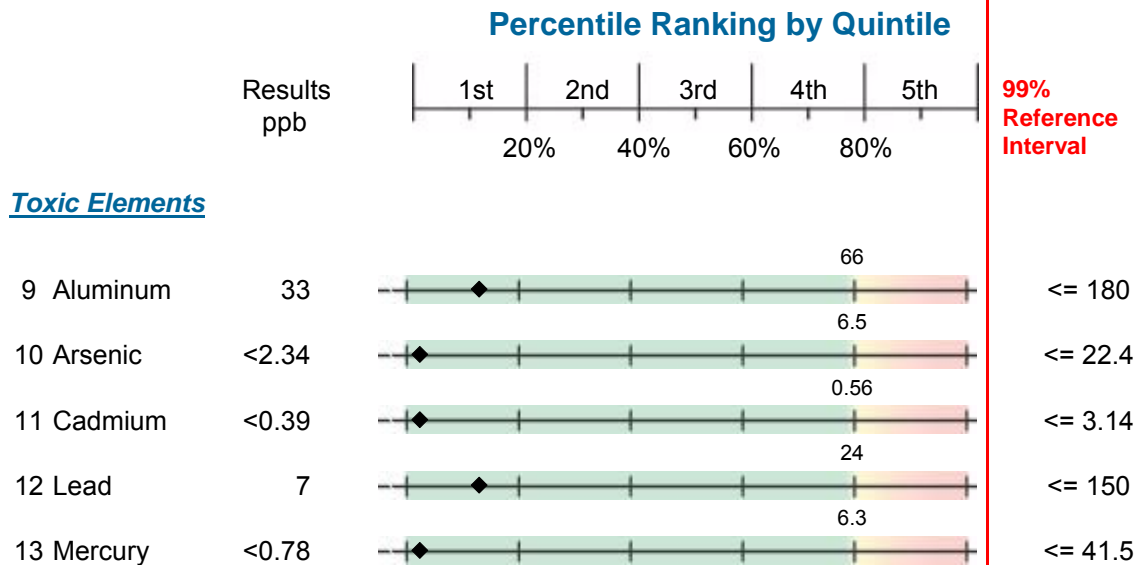
Element	Result	Percentile	Reference Limits	Units
1 Potassium	1,569	1,421	1,012 - 2,199	ppm packed cells
2 Magnesium *	20 L	22	16 - 32	ppm packed cells
3 Zinc	4.3 L	4.5	3.3 - 7.7	ppm packed cells
4 Copper	351	306	257 - 500	ppb packed cells
5 Manganese	32	24	19 - 41	ppb packed cells
6 Chromium	5.8	2.2	1.4 - 7.9	ppb packed cells
7 Selenium	0.14 L	0.19	0.14 - 0.47	ppm whole blood
8 Calcium	11	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.

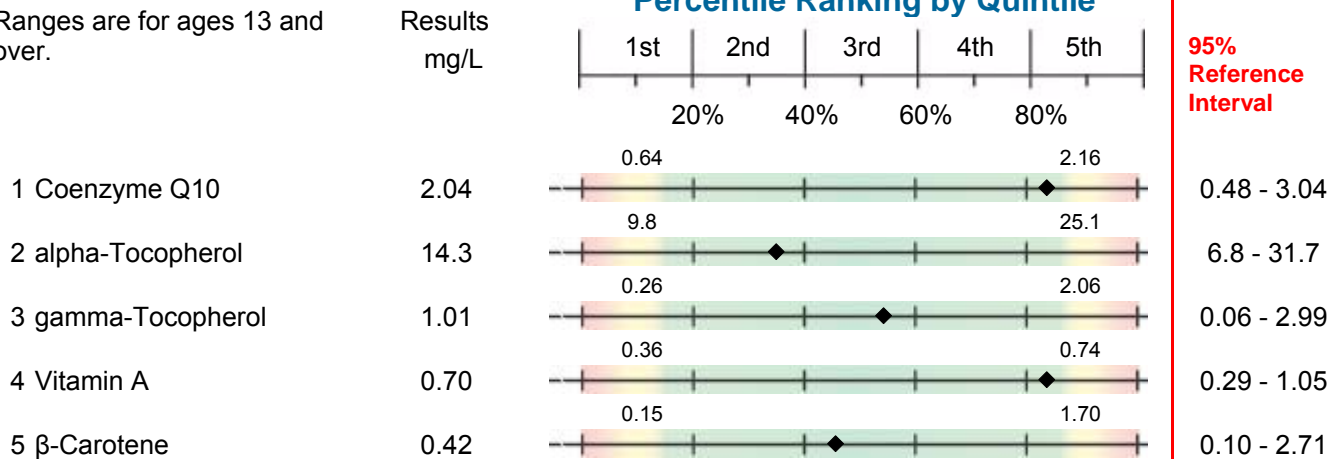
(2) Lanphear BP, Hornung R, Khoury J, et al. Low-level environmental lead exposure and children's intellectual function: an international pooled analysis. Environ Health Perspect. Jul 2005;113(7):894-899.

(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

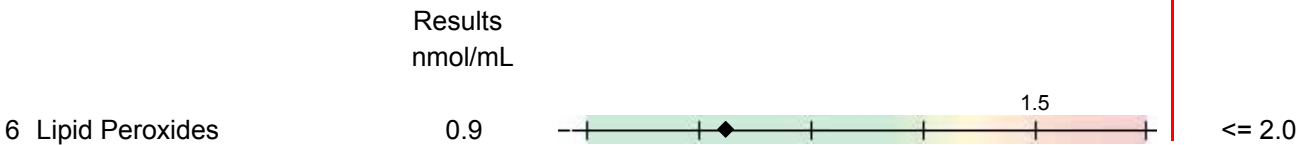
Methodology: High Performance Liquid Chromatography

Ranges are for ages 13 and over.



Lipid Peroxide - Serum

Methodology: High Performance Liquid Chromatography



8-Hydroxy-2 deoxyguanosine - Urine

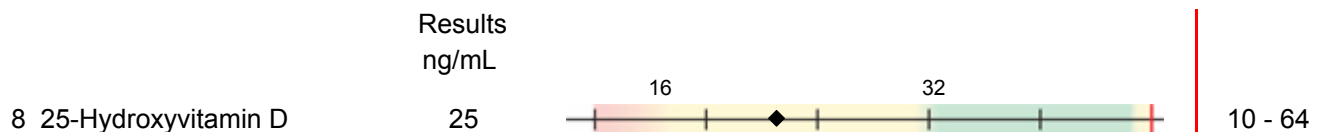
Methodology: LC/Tandem Mass Spectroscopy, Colorimetric

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.

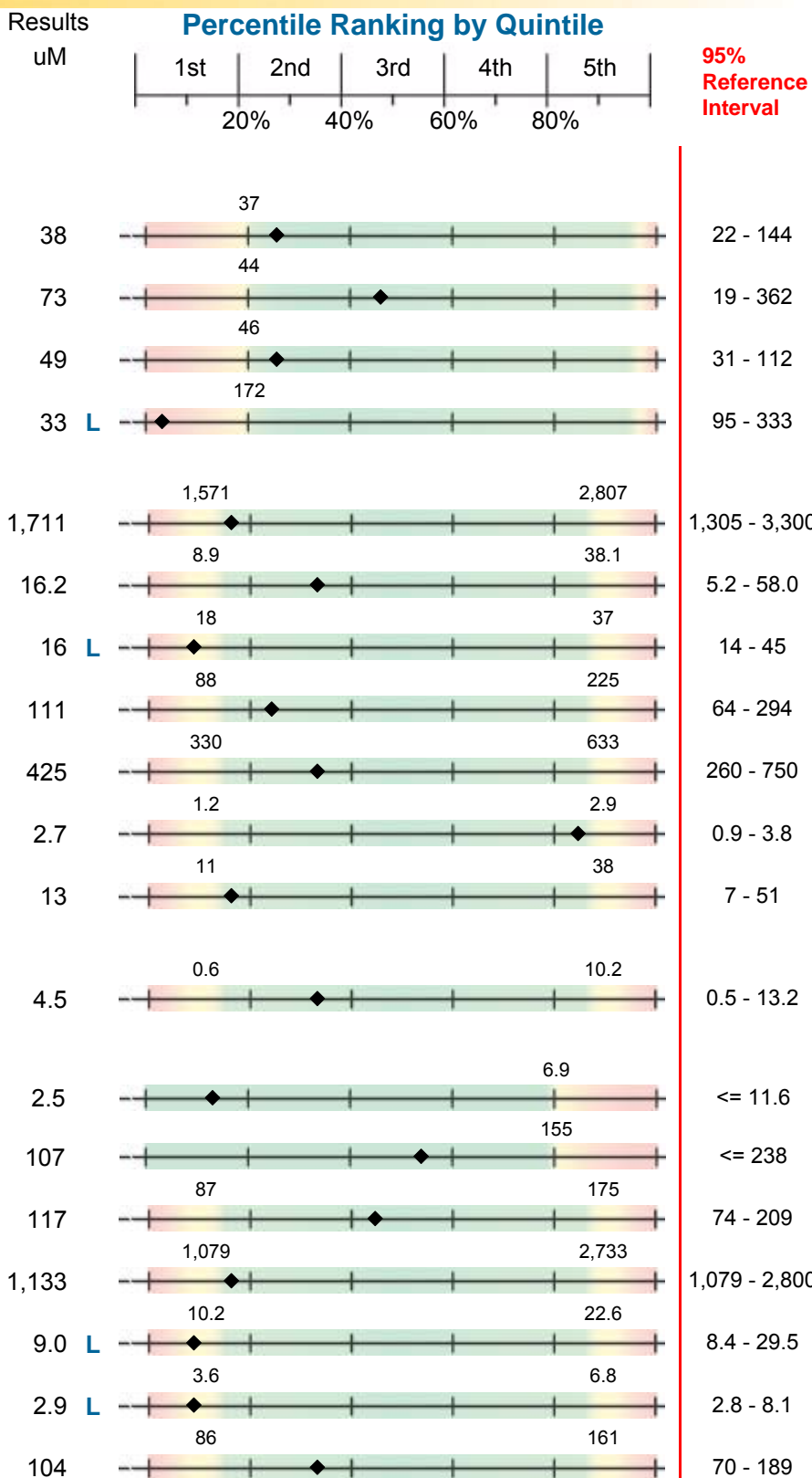
- Holick MF. Vitamin D deficiency. N Engl J Med. 2007;357(3):266-281.
- Hollis BW. Circulating 25-hydroxyvitamin D levels indicative of vitamin D sufficiency: implications for establishing a new effective dietary intake recommendation for vitamin D. J Nutr. Feb 2005;135(2):317-322.

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

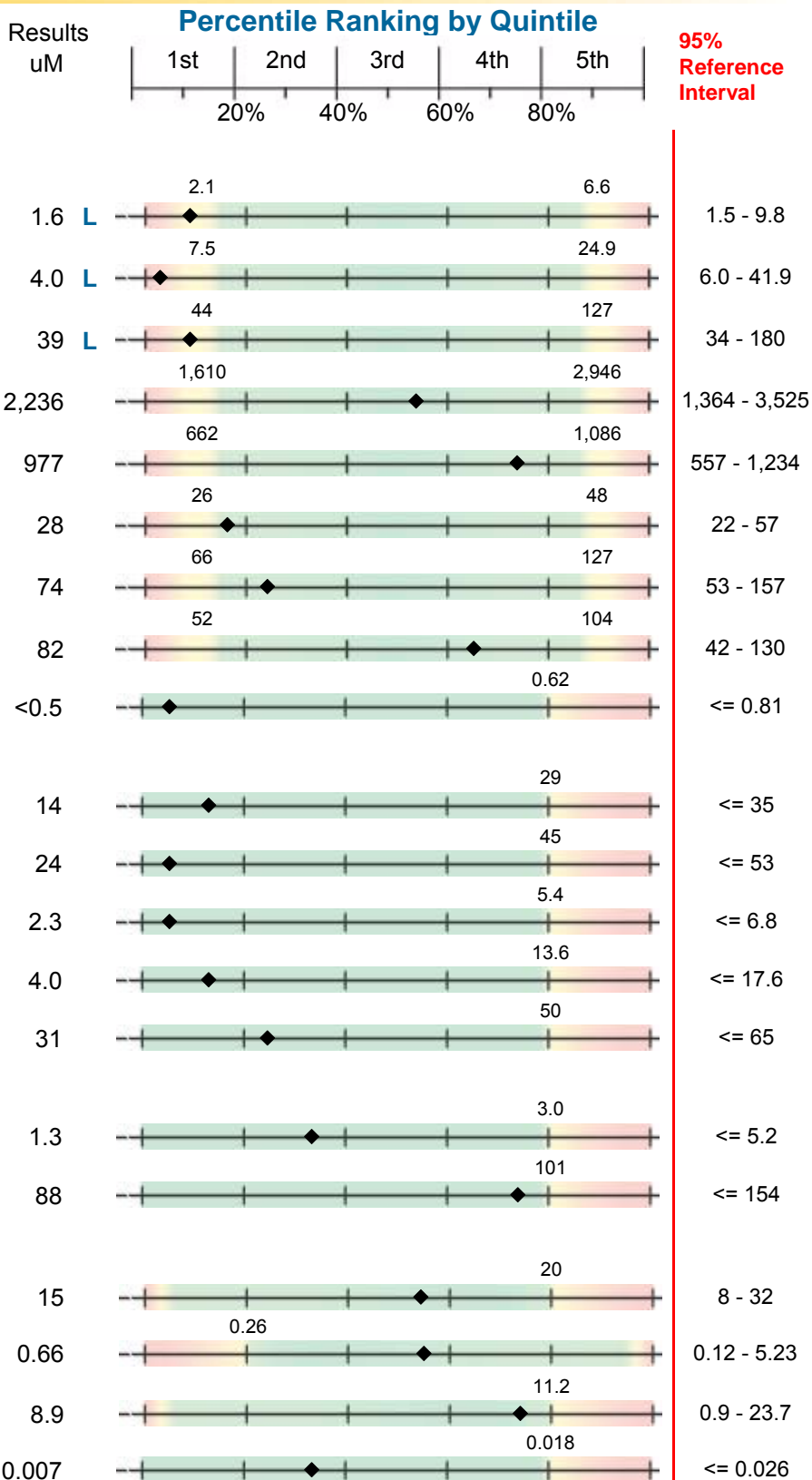
Ranges are for ages 13 and over.



Fatty Acids - Plasma

Methodology: Capillary Gas Chromatography/Mass Spectrometry

Ranges are for ages 13 and over.

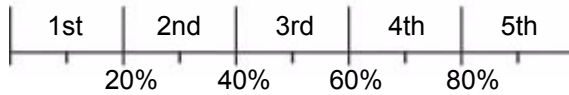


Organix™ Comprehensive - Urine

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	2.7		7.3	<= 11.7
2 Suberate	2.5 H		2.0	<= 3.7
3 Ethylmalonate	2.2		3.5	<= 6.3

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

4 Pyruvate	7.0 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	190		622	44 - 1,032
8 Cis-Aconitate	14 L		54	16 - 86
9 Isocitrate	40 L		105	43 - 157
10 α-Ketoglutarate	18		22	<= 38
11 Succinate	4.2		12.5	<= 25.7
12 Fumarate	<DL*		0.69	<= 1.69
13 Malate	0.7		1.4	<= 3.2
14 Hydroxymethylglutarate	2.7		4.2	<= 6.0

B-Complex Vitamin Markers
(B1, B2, B3, B5, B6, Biotin)

15 α-Ketoisovalerate	0.20		0.37	<= 0.69
16 α-Ketoisocaproate	0.11		0.45	<= 0.71
17 α-Keto-β-Methylvalerate	0.27		0.31	<= 0.86
18 Xanthurenate	0.07		0.89	<= 1.34
19 β-Hydroxyisovalerate	6.5		8.2	<= 11.7

Methylation Cofactor Markers
(B12, Folate)

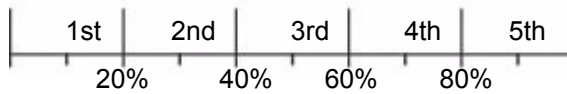
20 Methylmalonate	1.7		1.7	<= 2.4
21 Formiminoglutamate	<DL*		1.67	<= 2.94

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	2.4	1.7	4.5	1.2 - 6.0
23	Homovanillate	1.5 L	2.0	7.2	1.2 - 13.9
24	5-Hydroxyindoleacetate	1.9	1.6	8.1	0.9 - 50.8
25	Kynurenate	3.0 H		2.8	<= 4.4
26	Quinolinate	4.4 H		3.7	<= 5.2
27	Picolinate	8.5		8.5	3.1 - 15.0

Oxidative Damage and Antioxidant Markers
(Vitamin C and other antioxidants)

28	p-Hydroxyphenyllactate	0.11		1.09	<= 2.14
29	8-Hydroxy-2-deoxyguanosine *	7.3 H		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)

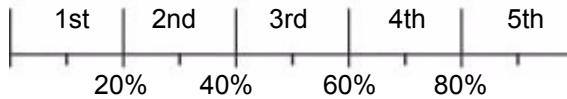
30	2-Methylhippurate	<DL*		0.039	<= 0.073
31	Orotate	0.5		0.8	<= 1.4
32	Glucarate	1.6		8.1	<= 14.5
33	a-Hydroxybutyrate	<DL*		0.4	<= 1.4
34	Pyroglutamate	9		51	<= 85
35	Sulfate	619 L	986	2,353	762 - 2,778

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	Percentile	Reference Range
36 Benzoate	8.1 H	1.1	<= 27.6
37 Hippurate	222	586	<= 1,102
38 Phenylacetate	<DL*	0.08	<= 0.29
39 Phenylpropionate	0.6 H	0.4	<= 0.4
40 p-Hydroxybenzoate	1.6 H	1.1	<= 2.9
41 p-Hydroxyphenylacetate	<DL*	23	<= 40
42 Indican	37	77	<= 120
43 Tricarballic acid	0.32	0.85	<= 1.55

L. acidophilus / general bacterial

44 D-Lactate	0.5	2.1	<= 6.5
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Clostridial species

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

46 D-Arabinitol	35 H	32	<= 59
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Creatinine = 195 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.

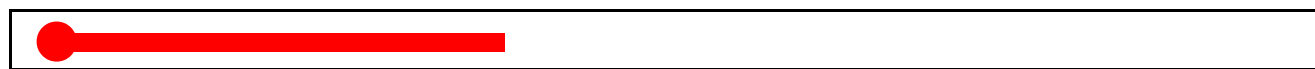
A multi-analyte report can provide greater insight about health risks and special nutrient needs. Patterns of abnormalities can reinforce the degree of significance indicated by a single measurement. Analytes from the various profiles in the ION report are combined below into categories associated with 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	X		Homocysteine	Calcium	Magnesium	L
CoQ10			a-Tocopherol	g-Tocopherol	Lipid Peroxide	
8-OHdG		H	AA/EPA			



Low significance

High significance

Fatigue

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

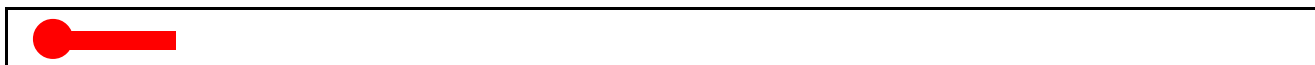


Low significance

High significance

Metabolic Syndrome (Syndrome X)

Chromium			Magnesium	Zinc	Palmitic	L
Stearic			AHB	BHB	BHiVal	

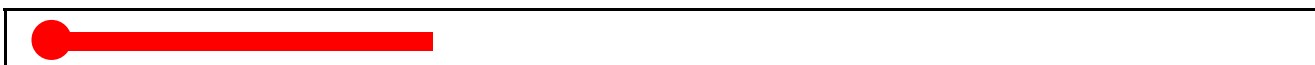


Low significance

High significance

Mental/Emotional

Tryptophan	L		Tyrosine	Magnesium	EPA	L
DHA		X	Xanthurenate	MeMalonate	FIGLU	
VMA			5-HIA			



Low significance

High significance

Intestinal Bacterial Metabolites

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



Low significance

High significance

Intestinal Yeasts / Fungal Metabolites

D-Arabinitol	H
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Low significance

High significance

Digestion/Absorption

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



Low significance

High significance

Toxic Exposure

Aluminum	Cadmium	Lead	Mercury
Palmitelaic	C18TrFa	Citrate	Cis-Aconitate
Isocitrate	Quinolate	H	Orotate
Glucarate			



Low significance

High significance

Detoxification Impairment

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

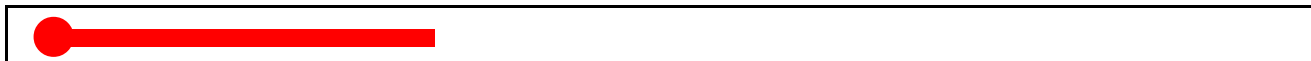


Low significance

High significance

Oxidative Stress/Antioxidant Insufficiency

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

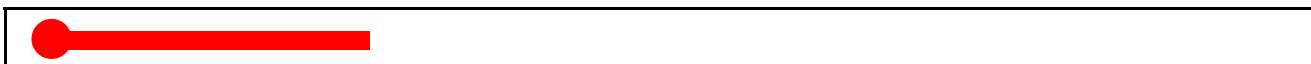


Low significance

High significance

Mitochondrial Functional Impairment

Magnesium	L	CoQ10		Adipate		Suberate	H
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		Threonine	L
Tryptophan	L	Valine		AKG		Succinate	
Sulfate	X L						



Low significance

High significance

Essential Fatty Acid Insufficiency

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



Low significance

High significance

Disordered Methyl Group (Single carbon) Transfer

Homocysteine		Pentadeca		Heptadeca		Nonadecanoic	
Tricosanoic		Xanthurenate		MeMalonate		FIGLU	
Kynurenate	H						

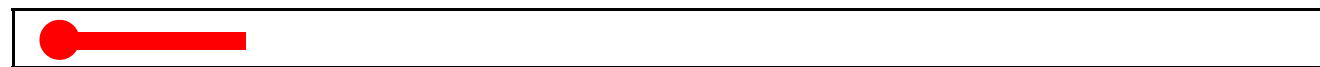


Low significance

High significance

Disordered Tryptophan Metabolism

Tryptophan	L	Xanthurenate	5-HIA	Kynurenate	H
Quinolinate	H	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
aKbMeVal	a-Keto-β-Methylvalerate	HVA	Homovanillate
aKiCap	a-Ketoisocaproate	HMG	Hydroxymethylglutarate
aKiVal	a-Ketoisovalerate	LA	Linoleic (18:2n6)
AKG	a-Ketoglutarate	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	2000 mg
Vitamin D	400 IU	200 IU
Vitamin E (Mixed Tocopherols)	100 IU	400 IU
Vitamin K*	100 mcg	
Thiamin (B1)	5 mg	5 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	
Calcium	500 mg	500 mg
Iodine*	75 mcg	
Magnesium	250 mg	200 mg
Zinc	15 mg	15 mg
Selenium	100 mcg	100 mcg
Copper	1 mg	
Manganese	5 mg	
Chromium	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.

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.

Item	Amount
Potential to Benefit from Probiotics	Strong
Antifungals	As needed
Carnitine	400 mg
Fish Oil	3 gm
Glycine	3000 mg
Lipoic Acid	100 mg
N-Acetylcysteine	400 mg
Need for Other Antioxidants	Moderate

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:	219 gm	% of Base	Grams Added	mg per day
	5-Hydroxytryptophan*	0.00 % +	1	33
	Arginine	9.40 % +	20	1353
	Histidine	10.10 % +	0	737
	Isoleucine	9.40 % +	0	686
	Leucine	12.90 % +	0	942
	Lysine	9.40 % +	18	1286
	Methionine	7.70 % +	17	1129
	Phenylalanine	12.90 % +	0	942
	Taurine	0.00 % +	10	333
	Threonine	8.10 % +	9	891
	Valine	11.10 % +	0	810
	Pyridoxal-5-phosphate	.3 % +	0	22
	Alpha-ketoglutaric acid	8.5 % +	0	621
	* ...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.