



William Shaw, Ph.D., Director

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Requisition #: 800236

Physician:

Patient Name:

Date of Collection: 7/12/2011

Patient Age: 21

Time of Collection: 00:00 AM

Patient Sex: M

Print Date: 02/14/2012



Organic Acids Test - Nutritional and Metabolic Profile

Metabolic Markers in Urine

Reference Range
(mmol/mol creatinine)

Patient
Value

Reference Population - Males Age 13 and Over

Intestinal Microbial Overgrowth

Yeast and Fungal Markers

Marker	Reference Range (mmol/mol creatinine)	Patient Value	Reference Population - Males Age 13 and Over
1 Citramalic	0.11 - 2.0	2.0	
2 5-Hydroxymethyl-2-furoic	≤ 18	18	
3 3-Oxoglutaric	≤ 0.11	H 1.1	
4 Furan-2,5-dicarboxylic	≤ 13	13	
5 Furancarboxylglycine	≤ 2.3	2.3	
6 Tartaric	≤ 5.3	5.3	
7 Arabinose	≤ 20	H 73	
8 Carboxycitric	≤ 20	20	
9 Tricarballic	≤ 0.58	H 65	

Malabsorption and Bacterial Markers

Marker	Reference Range (mmol/mol creatinine)	Patient Value	Reference Population - Males Age 13 and Over
10 2-Hydroxyphenylacetic	0.03 - 0.47	H 35	
11 4-Hydroxyphenylacetic	≤ 18	18	
12 4-Hydroxybenzoic	0.01 - 0.73	0.73	
13 4-Hydroxyhippuric	≤ 14	H 30	
14 Hippuric	≤ 241	241	
15 3-Indoleacetic	≤ 6.8	6.8	
16 Succinic	≤ 5.3	H 105	
17 HPPHA (Clostridia Marker)	≤ 102	102	
18 4-Cresol (C. difficile)	≤ 39	H 76	
19 DHPPA (Beneficial Bacteria)	≤ 0.23	0.23	

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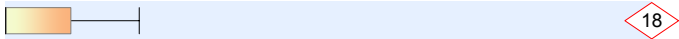
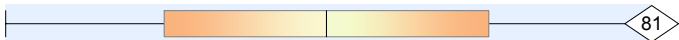
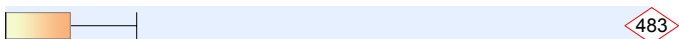
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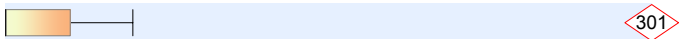
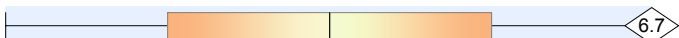
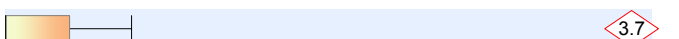
Date of Collection: 7/12/2011

Metabolic Markers in Urine Reference Range (mmol/mol creatinine) Patient Value Reference Population - Males Age 13 and Over

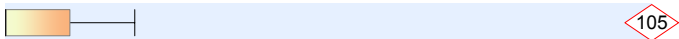
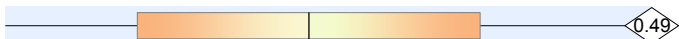
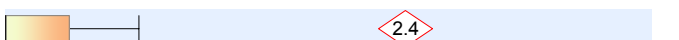
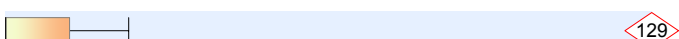

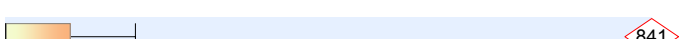
Oxalate Metabolites

20	Glyceric	0.21 - 4.9	H	18	
21	Glycolic	18 - 81		81	
22	Oxalic	8.9 - 67	H	483	

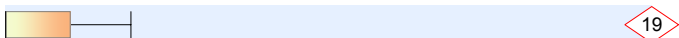
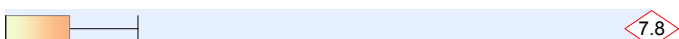
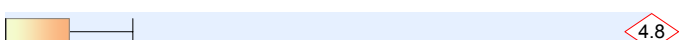
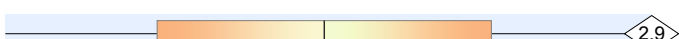
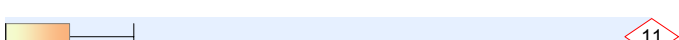

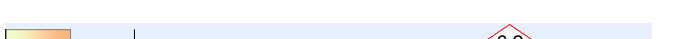
Glycolytic Cycle Metabolites

23	Lactic	0.74 - 19	H	301	
24	Pyruvic	0.28 - 6.7		6.7	
25	2-Hydroxybutyric	≤ 1.2	H	3.7	

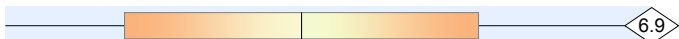
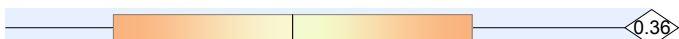
Krebs Cycle Metabolites

26	Succinic	≤ 5.3	H	105	
27	Fumaric	≤ 0.49		0.49	
28	Malic	≤ 1.1	H	2.4	
29	2-Oxoglutaric	≤ 18	H	129	
30	Aconitic	4.1 - 23	H	37	
31	Citric	2.2 - 260	H	841	

Neurotransmitter Metabolites

32	Homovanillic (HVA) <i>(dopamine)</i>	0.39 - 2.2	H	19	
33	Vanillylmandelic (VMA) <i>(norepinephrine, epinephrine)</i>	0.53 - 2.2	H	7.8	
34	HVA / VMA Ratio	0.32 - 1.4	H	4.8	
35	5-Hydroxyindoleacetic (5-HIAA) <i>(serotonin)</i>	≤ 2.9		2.9	
36	Quinolinic	0.52 - 2.4	H	11	
37	Kynurenic	0.12 - 1.8		1.8	
38	Quinolinic / 5-HIAA Ratio	≤ 2.5	H	6.2	

Pyrimidine Metabolites - Folate Metabolism

39	Uracil	≤ 6.9		6.9	
40	Thymine	≤ 0.36		0.36	

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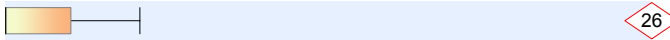
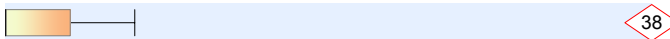
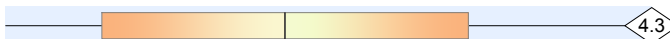
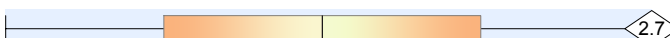
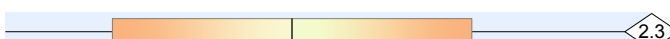
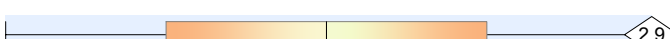
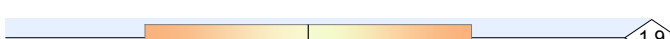

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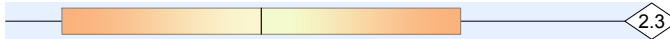
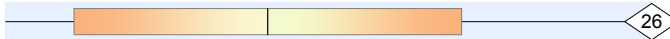
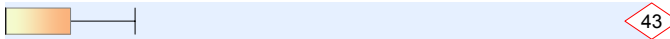
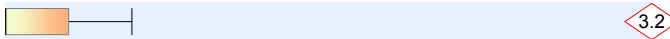
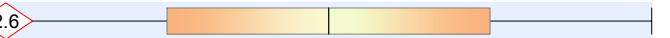
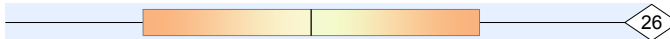
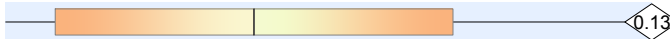
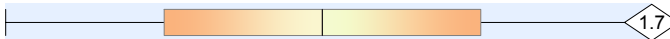
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Metabolic Markers in Urine Reference Range (mmol/mol creatinine) Patient Value Reference Population - Males Age 13 and Over

Ketone and Fatty Acid Oxidation

Code	Marker	Reference Range (mmol/mol creatinine)	Patient Value	Reference Population - Males Age 13 and Over
41	3-Hydroxybutyric	≤ 1.9	H 26	
42	Acetoacetic	≤ 10	H 38	
43	4-Hydroxybutyric	≤ 4.3	4.3	
44	Ethylmalonic	0.13 - 2.7	2.7	
45	Methylsuccinic	≤ 2.3	2.3	
46	Adipic	≤ 2.9	2.9	
47	Suberic	≤ 1.9	1.9	
48	Sebacic	≤ 0.14	H 0.46	

Nutritional Markers

Code	Marker	Reference Range (mmol/mol creatinine)	Patient Value	Reference Population - Males Age 13 and Over
Vitamin B12				
49	Methylmalonic*	≤ 2.3	2.3	
Vitamin B6				
50	Pyridoxic (B6)	≤ 26	26	
Vitamin B5				
51	Pantothenic (B5)	≤ 5.4	H 43	
Vitamin B2 (Riboflavin)				
52	Glutaric*	≤ 0.43	H 3.2	
Vitamin C				
53	Ascorbic	10 - 200	L 2.6	
Vitamin Q10 (CoQ10)				
54	3-Hydroxy-3-methylglutaric*	≤ 26	26	
Glutathione Precursor and Chelating Agent				
55	N-Acetylcysteine (NAC)	≤ 0.13	0.13	
Biotin (Vitamin H)				
56	Methylcitric*	0.15 - 1.7	1.7	

* A functional or indirect marker may be high due to lack of an essential cofactor (vitamin or mineral) for an enzyme reaction.

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Metabolic Markers in Urine Reference Range (mmol/mol creatinine) Patient Value Reference Population - Males Age 13 and Over

Indicators of Detoxification

Marker	Reference Range (mmol/mol creatinine)	Patient Value	Reference Population - Males Age 13 and Over
57 Pyroglutamic	5.7 - 25	25	
58 Orotic	≤ 0.46	0.46	
59 2-Hydroxyhippuric	≤ 0.86	H 1.6	

Amino Acid Metabolites

Marker	Reference Range (mmol/mol creatinine)	Patient Value	Reference Population - Males Age 13 and Over
60 2-Hydroxyisovaleric	≤ 0.41	0.41	
61 2-Oxoisovaleric	≤ 1.5	1.5	
62 3-Methyl-2-oxovaleric	≤ 0.56	0.56	
63 2-Hydroxyisocaproic	≤ 0.39	0.39	
64 2-Oxoisocaproic	≤ 0.34	0.34	
65 2-Oxo-4-methylbutyric	≤ 0.14	0.14	
66 Mandelic	≤ 0.09	0.09	
67 Phenyllactic	≤ 0.10	0.10	
68 Phenylpyruvic	0.02 - 1.4	1.4	
69 Homogentisic	≤ 0.23	0.23	
70 4-Hydroxyphenyllactic	≤ 0.62	0.62	
71 N-Acetylaspartic	≤ 2.5	2.5	
72 Malonic	≤ 9.9	9.9	
73 3-Methylglutaric	0.02 - 0.38	H 1.8	

Bone Metabolites

Marker	Reference Range (mmol/mol creatinine)	Patient Value	Reference Population - Males Age 13 and Over
74 Phosphoric	1 000 - 4 900	1 942	

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Indicator of Fluid Intake

75 *Creatinine 100 mg/dL

*The creatinine test is performed to adjust metabolic marker results for differences in fluid intake. Urinary creatinine has limited diagnostic value due to variability as a result of recent fluid intake. Samples are rejected if creatinine is below 20 mg/dL unless the client requests results knowing of our rejection criteria.

Explanation of Report Format

The reference ranges for organic acids were established using samples collected from typical individuals of all ages with no known physiological or psychological disorders. The ranges were determined by calculating the mean and standard deviation (SD) and are defined as $\pm 2SD$ of the mean. Reference ranges are age and gender specific, consisting of Male Adult (≥ 13 years), Female Adult (≥ 13 years), Male Child (< 13 years), and Female Child (< 13 years).

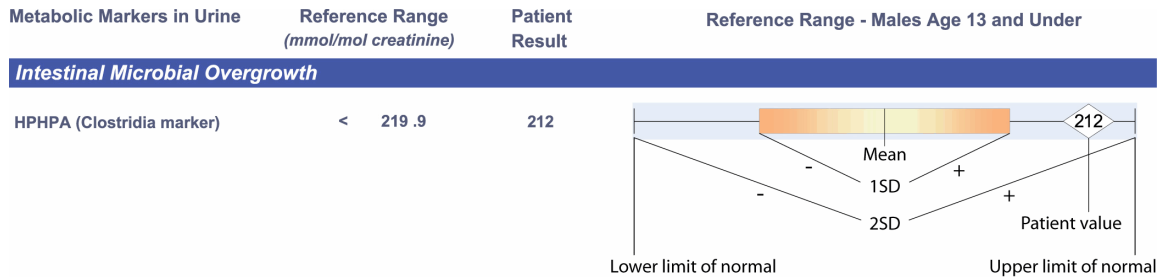
There are two types of graphical representations of patient values found in the new report format of both the standard Organic Acids Test and the Microbial Organic Acids Test.

The first graph will occur when the value of the patient is within the reference (normal) range, defined as the mean plus or minus two standard deviations.

The second graph will occur when the value of the patient exceeds the upper limit of normal. In such cases, the graphical reference range is "shrunk" so that the degree of abnormality can be appreciated at a glance. In this case, the lower limits of normal are not shown, only the upper limit of normal is shown.

In both cases, the value of the patient is given to the left of the graph and is repeated on the graph inside a diamond. If the value is within the normal range, the diamond will be outlined in black. If the value is high or low, the diamond will be outlined in red.

Example of Value Within Reference Range



Example of Elevated Value

