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Requisition #: 273466

Physician:

Patient Name:

Date of Collection: 07/30/2012

Patient Age: 4

Time of Collection: 08:00 AM

Patient Sex: F

Print Date: 08/02/2012



## Organic Acids Test - Nutritional and Metabolic Profile

Metabolic Markers in Urine

Reference Range  
(mmol/mol creatinine)

Patient  
Value

Reference Population - Females Under Age 13

### Intestinal Microbial Overgrowth

#### Yeast and Fungal Markers

Marker	Reference Range	Patient Value	Visual Representation
1 Citramalic	≤ 5.3	3.1	
2 5-Hydroxymethyl-2-furoic	≤ 30	7.4	
3 3-Oxoglutaric	≤ 0.52	0.50	
4 Furan-2,5-dicarboxylic	≤ 22	8.6	
5 Furancarboxylglycine	≤ 3.6	0.07	
6 Tartaric	≤ 3.9	9.0 <b>H</b>	
7 Arabinose	≤ 56	242 <b>H</b>	
8 Carboxycitric	≤ 34	1.3	
9 Tricarballic	≤ 0.86	0.08	

#### Malabsorption and Bacterial Markers

Marker	Reference Range	Patient Value	Visual Representation
10 2-Hydroxyphenylacetic	≤ 1.1	0.45	
11 4-Hydroxyphenylacetic	≤ 30	16	
12 4-Hydroxybenzoic	0.09 - 2.0	2.0	
13 4-Hydroxyhippuric	≤ 27	15	
14 Hippuric	≤ 717	377	
15 3-Indoleacetic	≤ 11	6.1	
16 Succinic	≤ 15	39 <b>H</b>	
17 HPPHA (Clostridia Marker)	≤ 227	148	
18 4-Cresol (C. difficile)	≤ 76	63	
19 DHPHA (Beneficial Bacteria)	≤ 0.73	0.29	

Testing performed by The Great Plains Laboratory, Inc., Lenexa, Kansas. The Great Plains Laboratory has developed and determined the performance characteristics of this test. This test has not been evaluated by the U.S. FDA; the FDA does not currently regulate such testing.

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## Oxalate Metabolites

20	Glyceric	0.71 - 9.5		3.6	
21	Glycolic	20 - 202		159	
22	Oxalic	15 - 174		148	

## Glycolytic Cycle Metabolites

23	Lactic	0.18 - 44	H	152	
24	Pyruvic	0.88 - 9.1		4.9	
25	2-Hydroxybutyric	≤ 2.2		1.1	

## Krebs Cycle Metabolites

26	Succinic	≤ 15	H	39	
27	Fumaric	0.04 - 1.3		0.19	
28	Malic	≤ 2.2		0.83	
29	2-Oxoglutaric	≤ 81		53	
30	Aconitic	11 - 35		17	
31	Citric	59 - 440	H	464	

## Neurotransmitter Metabolites

32	Homovanillic (HVA) <i>(dopamine)</i>	≤ 14		8.2	
33	Vanillylmandelic (VMA) <i>(norepinephrine, epinephrine)</i>	0.87 - 5.9		4.3	
34	HVA / VMA Ratio	0.12 - 3.0		1.9	
35	5-Hydroxyindoleacetic (5-HIAA) <i>(serotonin)</i>	≤ 7.7		2.3	
36	Quinolinic	0.63 - 6.7	H	7.4	
37	Kynurenic	≤ 4.1		4.1	
38	Quinolinic / 5-HIAA Ratio	0.04 - 2.2	H	3.3	

## Pyrimidine Metabolites - Folate Metabolism

39	Uracil	≤ 19		12	
40	Thymine	0.01 - 0.89		0.30	

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## Ketone and Fatty Acid Oxidation

41	3-Hydroxybutyric	≤ 4.1		2.4	
42	Acetoacetic	≤ 10		1.2	
43	4-Hydroxybutyric	≤ 3.4		0.55	
44	Ethylmalonic	≤ 4.6		3.8	
45	Methylsuccinic	≤ 4.3	<b>H</b>	4.4	
46	Adipic	≤ 9.7		5.5	
47	Suberic	≤ 9.5		4.1	
48	Sebacic	≤ 0.37		0.08	

## Nutritional Markers

### Vitamin B12

49	Methylmalonic *	≤ 6.2		3.0	
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### Vitamin B6

50	Pyridoxic (B6)	≤ 59		2.7	
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### Vitamin B5

51	Pantothenic (B5)	≤ 26		13	
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### Vitamin B2 (Riboflavin)

52	Glutaric *	≤ 1.1		0.35	
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### Vitamin C

53	Ascorbic	10 - 200	<b>L</b>	0.82	
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### Vitamin Q10 (CoQ10)

54	3-Hydroxy-3-methylglutaric *	≤ 101		55	
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### Glutathione Precursor and Chelating Agent

55	N-Acetylcysteine (NAC)	≤ 0.41		0.09	
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### Biotin (Vitamin H)

56	Methylcitric *	≤ 5.5		4.9	
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\* A high value for this marker may indicate a deficiency of this vitamin.

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## Indicators of Detoxification

57	Pyroglutamic	7.0 - 63		52	
58	Orotic	≤ 0.88		0.36	
59	2-Hydroxyhippuric	≤ 1.2	H	3.2	

## Amino Acid Metabolites

60	2-Hydroxyisovaleric	≤ 1.2		0.63	
61	2-Oxoisovaleric	0.03 - 2.4	L	0	
62	3-Methyl-2-oxovaleric	≤ 1.1		0	
63	2-Hydroxyisocaproic	≤ 0.70		0.07	
64	2-Oxoisocaproic	≤ 0.54		0.05	
65	2-Oxo-4-methylbutyric	≤ 0.30		0.03	
66	Mandelic	≤ 0.28	H	0.38	
67	Phenyllactic	≤ 0.27		0.11	
68	Phenylpyruvic	0.45 - 2.3	L	0.12	
69	Homogentisic	≤ 0.51		0.06	
70	4-Hydroxyphenyllactic	0.04 - 1.1		0.59	
71	N-Acetylaspartic	≤ 8.1		2.8	
72	Malonic	≤ 12		1.7	
73	3-Methylglutaric	0.07 - 0.95	H	1.6	
74	3-Hydroxyglutaric	≤ 11	H	18	
75	3-Methylglutaconic	≤ 6.4		1.7	

## Bone Metabolites

76	Phosphoric	1 000 - 7 300		2 761	
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## Indicator of Fluid Intake

77 \*Creatinine

72 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 ( $\geq 13$  years), Female Adult ( $\geq 13$  years), Male Child ( $< 13$  years), and Female Child ( $< 13$  years).

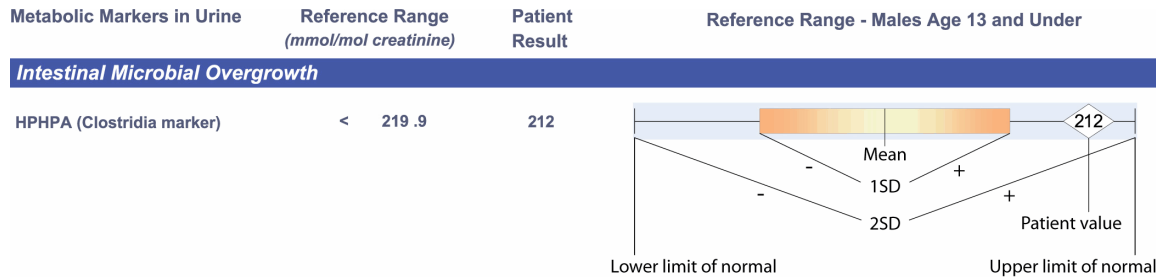
There are two types of graphical representations of patient values found in the new report format of both the standard Organic Acids Test and the Microbial Organic Acids Test.

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.

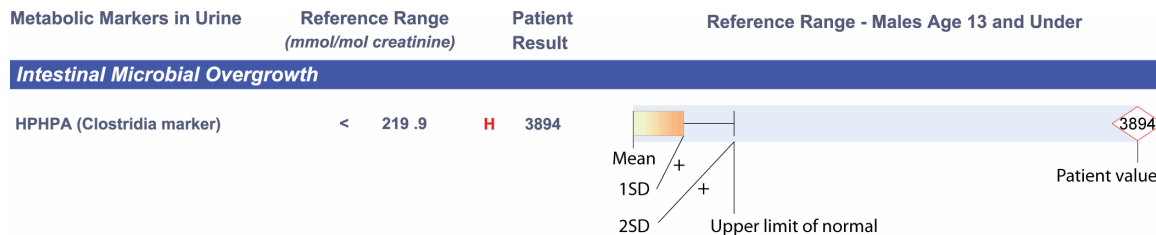
The second graph will occur when the value of the patient exceeds the upper limit of normal. In such cases, the graphical reference range is "shrunk" so that the degree of abnormality can be appreciated at a glance. In this case, the lower limits of normal are not shown, only the upper limit of normal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



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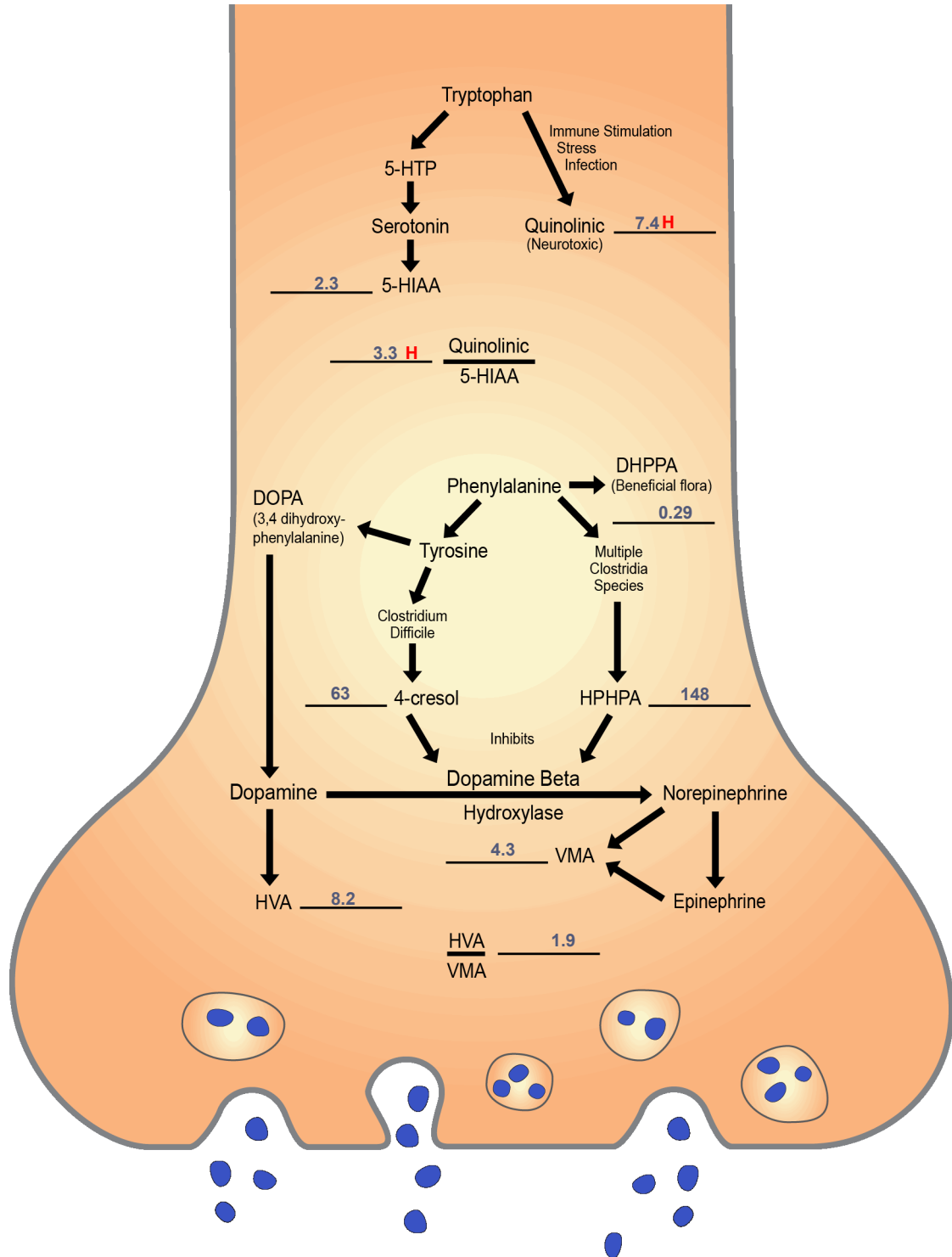
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## Neurotransmitter Metabolism Markers



The diagram contains the patient's test results for neurotransmitter metabolites and shows their relationship with key biochemical pathways within the axon terminal of nerve cells. The effect of microbial byproducts on the blockage of the conversion of dopamine to norepinephrine is also indicated.