The Great Plains Laboratory, Inc.

William Shaw, Ph.D., Director | 11813 West 77th Street, Lenexa, KS 66214 | (913) 341-8949 | Fax (913) 341-6207

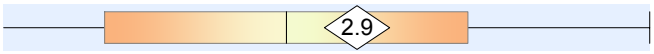
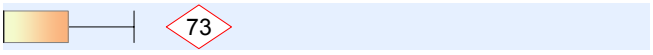
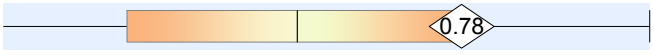
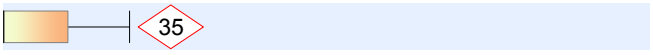
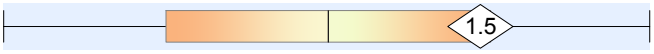
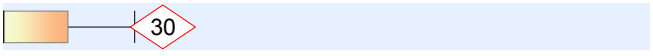
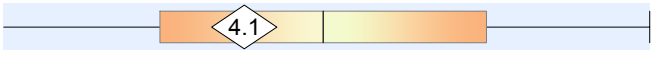
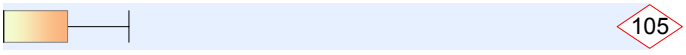
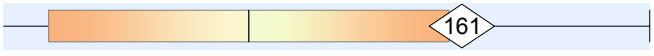
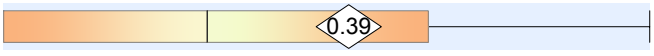
Requisition #: ***Physician Name:***

Patient Name: ***Date of Collection:***

Patient Age: ***Time of Collection:***

Sex: ***Print Date:***

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				
1 Citramalic	≤ 5.3		2.9	
2 5-Hydroxymethyl-2-furoic	≤ 30		4.3	
3 3-Oxoglutaric	≤ 0.52	H	1.1	
4 Furan-2,5-dicarboxylic	≤ 22		1.6	
5 Furancarbonylglycine	≤ 3.6		0.74	
6 Tartaric	≤ 3.9		1.4	
7 Arabinose	≤ 56	H	73	
8 Carboxycitric	≤ 34		1.1	
Malabsorption and Bacterial Markers				
9 2-Hydroxyphenylacetic	≤ 1.1		0.78	
10 4-Hydroxyphenylacetic	≤ 30	H	35	
11 4-Hydroxybenzoic	0.09 - 2.0		1.5	
12 4-Hydroxyhippuric	≤ 27	H	30	
13 Hippuric	≤ 717		281	
14 3-Indoleacetic	≤ 11		4.1	
15 Succinic	≤ 15	H	105	
16 HPHPA (Clostridia marker)	≤ 227		161	
17 DHPPA (beneficial bacteria)	≤ 0.73		0.39	

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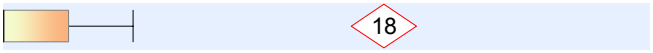
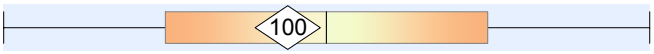
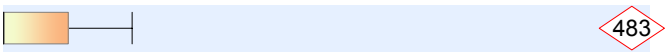
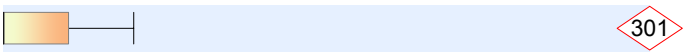
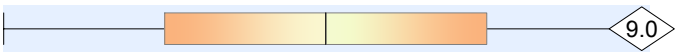
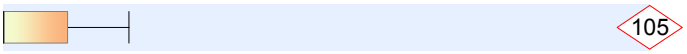
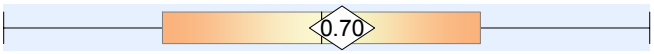
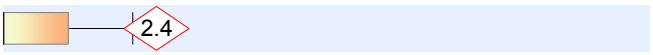
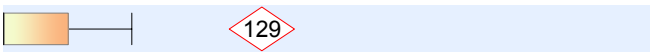
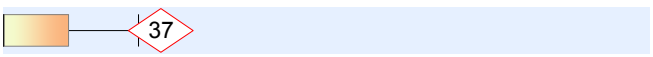
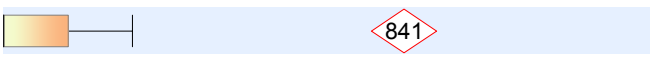
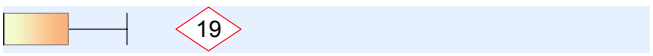
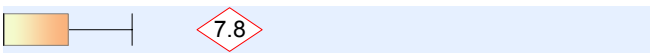
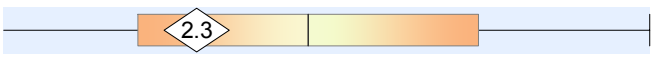
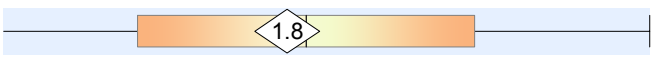
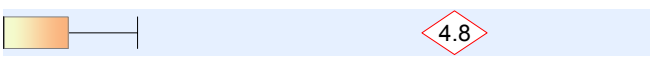
Patient Name: *Date of Collection:*

Metabolic Markers in Urine	Reference Range (mmol/mol creatinine)	Patient Value	Reference Population - Females Under Age 13
Oxalate Metabolites			
18 Glyceric	0.71 - 9.5	H 18	
19 Glycolic	20 - 202	100	
20 Oxalic	15 - 174	H 483	
Glycolytic Cycle Metabolites			
21 Lactic	0.18 - 44	H 301	
22 Pyruvic	0.88 - 9.1	9.0	
23 2-Hydroxybutyric	≤ 2.2	H 3.7	
Krebs Cycle Metabolites			
24 Succinic	≤ 15	H 105	
25 Fumaric	0.04 - 1.3	0.70	
26 Malic	≤ 2.2	H 2.4	
27 2-Oxoglutaric	≤ 81	H 129	
28 Aconitic	11 - 35	H 37	
29 Citric	59 - 440	H 841	
Neurotransmitter Metabolites			
30 Homovanillic (HVA)	≤ 14	H 19	
31 Vanillylmandelic (VMA)	0.87 - 5.9	H 7.8	
32 5-Hydroxyindoleacetic (5-HIAA)	≤ 7.7	2.3	
33 Quinolinic	0.63 - 6.7	H 11	
34 Kynurenic	≤ 4.1	1.8	
35 Quinolinic / 5-HIAA Ratio	0.04 - 2.2	H 4.8	
36 Quinolinic / Kynurenic Ratio	0.36 - 3.8	H 6.2	

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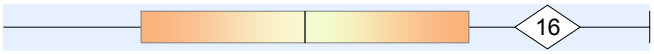
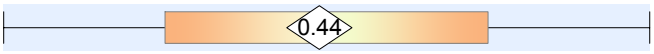
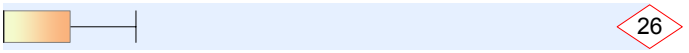
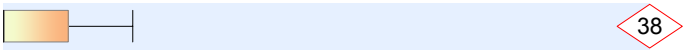
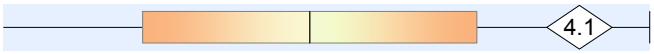
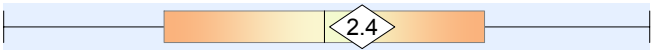
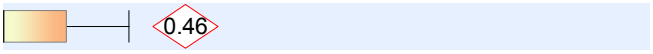
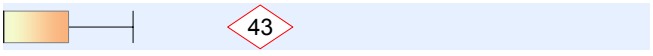
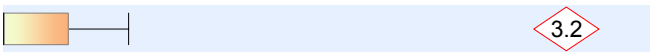
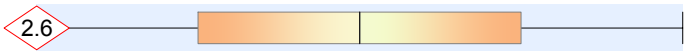
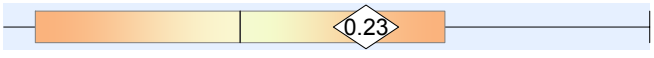
Metabolic Markers in Urine	Reference Range (mmol/mol creatinine)		Patient Value	Reference Population - Females Under Age 13
Pyrimidine Metabolites				
37 Uracil	≤ 19		16	
38 Thymine	0.02 - 0.88		0.44	
Ketone and Fatty Acid Oxidation				
39 3-Hydroxybutyric	≤ 4.1	H	26	
40 Acetoacetic	≤ 10	H	38	
41 4-Hydroxybutyric	≤ 3.4		0.44	
42 Ethylmalonic	≤ 4.6		4.1	
43 Methylsuccinic	≤ 4.3		2.4	
44 Adipic	≤ 9.7		2.8	
45 Suberic	≤ 9.5		6.5	
46 Sebacic	≤ 0.37	H	0.46	
Nutritional Markers				
Vitamin B12				
47 Methylmalonic	≤ 6.2		5.2	
Vitamin B6				
48 Pyridoxic	≤ 59		8.0	
Vitamin B5				
49 Pantothenic	≤ 26	H	43	
Vitamin B2 (Riboflavin)				
50 Glutaric	≤ 1.1	H	3.2	
Vitamin C				
51 Ascorbic	10 - 200	L	2.6	
Vitamin Q10 (CoQ10)				
52 3-Hydroxy-3-methylglutaric	≤ 101		47	
Glutathione Precursor and Chelating Agent				
53 N-Acetylcysteine	≤ 0.41		0.23	

The Great Plains Laboratory, Inc.

Requisition #: *Physician Name:*

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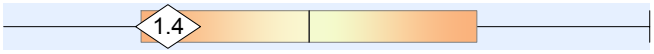
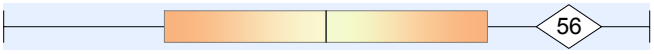
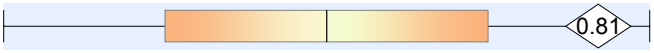
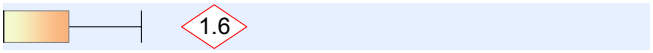
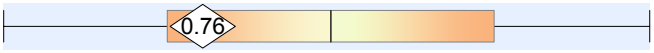
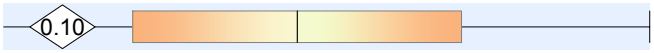
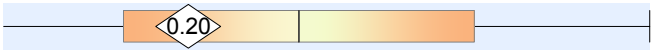
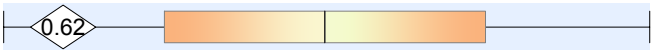
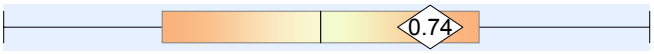
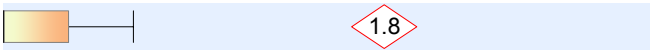
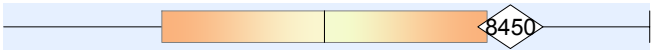
Metabolic Markers in Urine	Reference Range (mmol/mol creatinine)		Patient Value	Reference Population - Females Under Age 13
Nutritional Markers				
Biotin (Vitamin H)				
54 Methylcitric	≤ 5.5		1.4	
Indicators of Detoxification				
55 Pyroglutamic	7.0 - 63		56	
56 Orotic	≤ 0.88		0.81	
57 2-Hydroxyhippuric	≤ 1.2	H	1.6	
Amino Acid Metabolites				
58 2-Hydroxyisovaleric	≤ 1.2		0.85	
59 2-Oxoisovaleric	0.03 - 2.4		0.76	
60 3-Methyl-2-oxovaleric	≤ 1.1		0.10	
61 2-Hydroxyisocaproic	≤ 0.70		0.20	
62 2-Oxoisocaproic	≤ 0.54		0.09	
63 2-Oxo-4-methiolbutyric	≤ 0.30		0.11	
64 Mandelic	≤ 0.28		0.17	
65 Phenyllactic	≤ 0.27		0.02	
66 Phenylpyruvic	0.45 - 2.3		0.62	
67 Homogentisic	≤ 0.51		0.09	
68 4-Hydroxyphenyllactic	0.04 - 1.1		0.74	
69 N-Acetylaspartic	≤ 8.1		2.3	
70 Malonic	≤ 12		3.5	
71 3-Methylglutaric	0.07 - 0.95	H	1.8	
Bone Metabolites				
72 Phosphoric	≤ 10769		8450	

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Indicator of Fluid Intake

73	*Creatinine	31	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 ± 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.

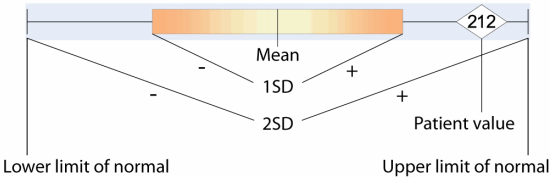
The first graph will occur when the value of the patient is within the reference (normal) range, defined as the mean plus or minus two standard deviations.

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.

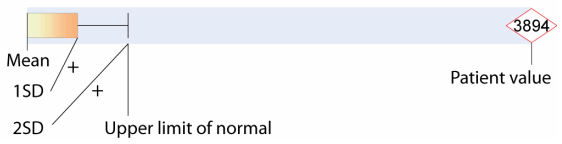
Example of Value Within Reference Range

Metabolic Markers in Urine	Reference Range *(mmol/mol creatinine)*		Patient Result
Intestinal Microbial Overgrowth			
HPHPA (Clostridia marker)	<	219 .9	212



Example of Elevated Value

Metabolic Markers in Urine	Reference Range *(mmol/mol creatinine)*			Patient Result
Intestinal Microbial Overgrowth				
HPHPA (Clostridia marker)	<	219 .9	H	3894



URINE AMINO ACIDS

The Great Plains Laboratory, Inc.
William Shaw, Ph.D Director 11813 W. 77th Street, Lenexa, KS 66214 (913) 341-8949 Fax (913) 341-6207

LAB#:
PATIENT:
SEX:
AGE:
CLIENT#:

SPECIMEN VALIDITY

SPECIMEN MARKERS	RESULT	REFERENCE RANGE	PERCENTILE (2.5th / 16th / 50th / 84th / 97.5th)
Creatinine	160	45- 225 mg/dL	
Glutamine/Glutamate	28	5- 160	
Ammonia Level	32700	9000- 39000 µM	
SPECIMEN VALIDITY INDEX			

ESSENTIAL / CONDITIONALLY INDISPENSABLE AMINO ACIDS

ESSENTIAL AMINO ACIDS	RESULT µM/g creatinine	REFERENCE RANGE	PERCENTILE (2.5th / 16th / 50th / 84th / 97.5th)
Methionine	6	7- 35	
Lysine	84	35- 500	
Threonine	190	60- 230	
Leucine	43	18- 70	
Isoleucine	9.9	8- 35	
Valine	47	12- 50	
Phenylalanine	54	25- 75	
Tryptophan	87	20- 75	
Taurine	3120	170- 1200	
Cysteine	44	20- 57	
Arginine	30	8- 50	
Histidine	1030	270- 1150	

NONESSENTIAL AMINO ACIDS

NONESSENTIAL AMINO ACIDS	RESULT µM/g creatinine	REFERENCE RANGE	PERCENTILE (2.5th / 16th / 50th / 84th / 97.5th)
Alanine	310	100- 500	
Aspartate	11	7- 23	
Asparagine	140	40- 180	
Glutamine	650	180- 530	
Glutamate	23	5- 45	
Cystine	26	20- 90	
Glycine	930	400- 1800	
Tyrosine	110	23- 113	
Serine	390	130- 400	
Proline	3.5	1- 45	

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GASTROINTESTINAL MARKERS

GI MARKERS	RESULT µM/g creatinine	REFERENCE RANGE	PERCENTILE 2.5th 16th 50th 84th 97.5th
Ammonia	32700	9000- 39000	
Ethanolamine	280	120- 330	
Alpha-Aminoadipate	110	7- 50	
Threonine	190	60- 230	
Tryptophan	87	20- 75	
Taurine	3120	170- 1200	
			68th 95th
Beta-alanine	82	< 20	
Beta-aminoisobutyrate	120	< 300	
Anserine	67	< 60	
Carnosine	160	< 35	
Gamma-aminobutyrate	1.9	< 15	
Hydroxyproline	7.4	< 32	

MAGNESIUM DEPENDANT MARKERS

MAGNESIUM MARKERS	RESULT µM/g creatinine	REFERENCE RANGE	PERCENTILE 2.5th 16th 50th 84th 97.5th
Citrulline	3	1- 24	
Ethanolamine	280	120- 330	
Phosphoethanolamine	46	15- 56	
Phosphoserine	0.25	0.06- 0.6	
Serine	390	130- 400	
Taurine	3120	170- 1200	
			68th 95th
Methionine Sulfoxide	3.5	< 10	

B6, B12, & FOLATE DEPENDANT MARKERS

B-VITAMIN MARKERS	RESULT µM/g creatinine	REFERENCE RANGE	PERCENTILE 2.5th 16th 50th 84th 97.5th
Serine	390	130- 400	
Alpha-aminoadipate	110	7- 50	
Cysteine	44	20- 57	
Cystathionine	64	7- 40	
1-Methylhistidine	400	75- 240	
3-Methylhistidine	1800	50- 900	
Alpha-amino-N-butyrate	15	7- 50	
			68th 95th
Beta-aminoisobutyrate	120	< 300	
Beta-alanine	82	< 20	
Homocystine	< dl	< 5	
Sarcosine	4	< 35	

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LAB#:
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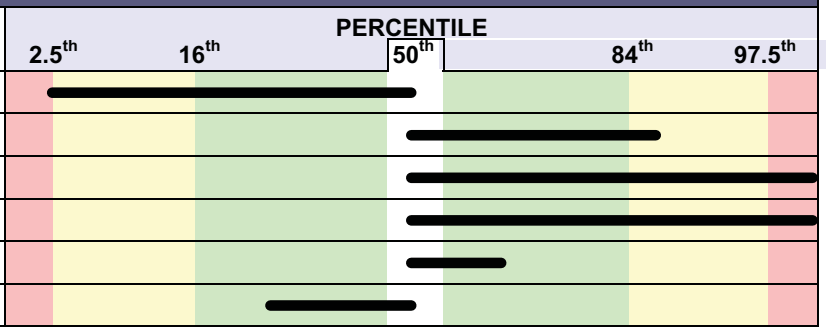
AGE:
CLIENT#:

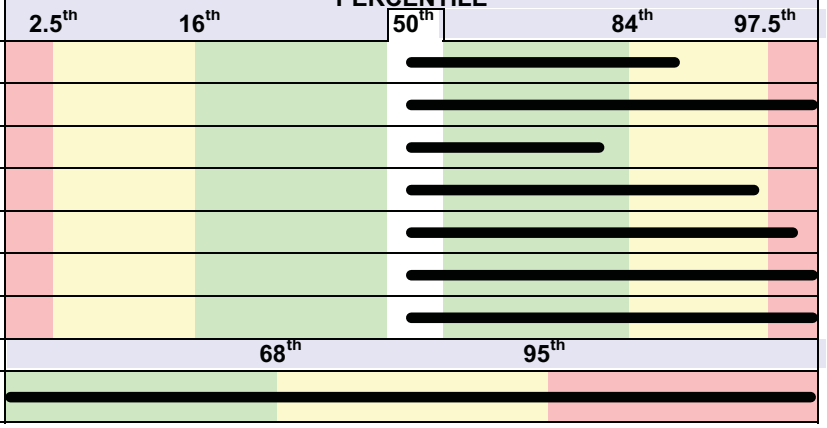
DETOXIFICATION MARKERS

DETOX MARKERS	RESULT µM/g creatinine	REFERENCE RANGE
Methionine	6	7- 35
Cysteine	44	20- 57
Taurine	3120	170- 1200
Glutamine	650	180- 530
Glycine	930	400- 1800
Aspartate	11	7- 23



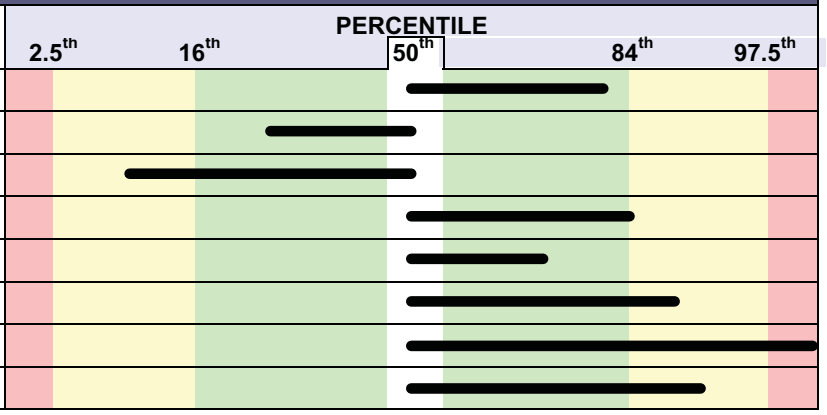
NEUROLOGICAL MARKERS

NEUROLOGICAL MARKERS	RESULT µM/g creatinine	REFERENCE RANGE
Ammonia	32700	9000- 39000
Glutamine	650	180- 530
Phenylalanine	54	25- 75
Tyrosine	110	23- 113
Tryptophan	87	20- 75
Taurine	3120	170- 1200
Cystathionine	64	7- 40
Beta-alanine	82	< 20



UREA CYCLE METABOLITES

UREA CYCLE METABOLITES	RESULT µM/g creatinine	REFERENCE RANGE
Arginine	30	8- 50
Aspartate	11	7- 23
Citrulline	3	1- 24
Ornithine	16	3- 35
Urea	330	150- 480
Ammonia	32700	9000- 39000
Glutamine	650	180- 530
Asparagine	140	40- 180



SPECIMEN DATA

Comments:
Date Collected:
Date Received:
Date Completed:
Methodology:
Collection Period:
Body Surface Area: