

24-HOUR URINE AMINO ACIDS



LAB#: U000000-0000-0
PATIENT: Sample Patient
SEX: Male
AGE: 14

CLIENT#: 12345
DOCTOR:
Doctor's Data, Inc.
3755 Illinois Ave.
St. Charles, IL 60174

SPECIMEN VALIDITY

SPECIMEN MARKERS	RESULT PER 24 HOURS	REFERENCE RANGE	PERCENTILE					
			2.5 th	16 th	50 th	84 th	97.5 th	
Creatinine	1240	600- 1900mg			•			
24 Hour Volume	1450	450- 1500mL			—————			
Glutamine/Glutamate	20	5- 160			—————			
Ammonia Level	19800	11000- 60000µM			—————			

SPECIMEN VALIDITY INDEX



ESSENTIAL / CONDITIONALLY INDISPENSABLE AMINO ACIDS

ESSENTIAL AMINO ACIDS	RESULT µMOLE/24 HRS	REFERENCE RANGE	PERCENTILE					
			2.5 th	16 th	50 th	84 th	97.5 th	
Methionine	17	10- 60			—————			
Lysine	35	32- 300	—————					
Threonine	130	75- 310			—————			
Leucine	37	28- 120			—————			
Isoleucine	12	12- 60	—————					
Valine	44	17- 85			—————			
Phenylalanine	52	25- 115			—————			
Tryptophan	46	20- 140			—————			
Taurine	1740	320- 1600			—————			
Cysteine	46	22- 79			—————			
Arginine	18	6- 40			•			
Histidine	760	350- 2300			—————			

NONESENTIAL AMINO ACIDS

NONESENTIAL AMINO ACIDS	RESULT µMOLE/24 HRS	REFERENCE RANGE	PERCENTILE					
			2.5 th	16 th	50 th	84 th	97.5 th	
Alanine	370	130- 650			—————			
Aspartate	23	26- 115	—————					
Asparagine	79	50- 230			—————			
Glutamine	530	220- 900			—————			
Glutamate	27	5- 47			—————			
Cystine	41	20- 90			—————			
Glycine	2010	480- 4100			—————			
Tyrosine	140	39- 290			—————			
Serine	530	190- 675			—————			
Proline	18	1- 65			—————			



GASTROINTESTINAL MARKERS							
GI MARKERS	RESULT μMOLE/24 HRS	REFERENCE RANGE	PERCENTILE				
			2.5 th	16 th	50 th	84 th	97.5 th
Ammonia	19800	11000- 60000					
Ethanolamine	460	100- 550					
Alpha-Aminoadipate	44	5- 65					
Threonine	130	75- 310					
Tryptophan	46	20- 140					
Taurine	1740	320- 1600					
			68 th		95 th		
Beta-alanine	46	< 18					
Beta-aminoisobutyrate	61	< 200					
Anserine	7.6	< 90					
Carnosine	180	< 100					
Gamma-aminobutyrate	0.76	< 7					
Hydroxyproline	27	< 50					

MAGNESIUM DEPENDANT MARKERS							
MAGNESIUM MARKERS	RESULT μMOLE/24 HRS	REFERENCE RANGE	PERCENTILE				
			2.5 th	16 th	50 th	84 th	97.5 th
Citrulline	1.5	1- 32					
Ethanolamine	460	100- 550					
Phosphoethanolamine	37	25- 105					
Phosphoserine	170	25- 115					
Serine	530	190- 675					
Taurine	1740	320- 1600					
			68 th		95 th		
Methionine Sulfoxide	15	< 2					

B6, B12, & FOLATE DEPENDANT MARKERS							
B-VITAMIN MARKERS	RESULT μMOLE/24 HRS	REFERENCE RANGE	PERCENTILE				
			2.5 th	16 th	50 th	84 th	97.5 th
Serine	530	190- 675					
Alpha-aminoacidipate	44	5- 65					
Cysteine	46	22- 79					
Cystathionine	18	6- 50					
1-Methylhistidine	64	55- 800					
3-Methylhistidine	210	60- 400					
Alpha.amino.N.butyrate	15	5- 65					
			68 th		95 th		
Beta-aminoisobutyrate	61	< 200					
Beta-alanine	46	< 18					
Homocystine	0.76	< 5					
Sarcosine	3	< 5					

DETOXIFICATION MARKERS						
DETOX MARKERS	RESULT μMOLE/24 HRS	REFERENCE RANGE	PERCENTILE			
			2.5 th	16 th	50 th	84 th 97.5 th
Methionine	17	10- 60	[Bar chart showing result at ~10th percentile]			
Cysteine	46	22- 79	[Bar chart showing result at ~50th percentile]			
Taurine	1740	320- 1600	[Bar chart showing result at ~80th percentile]			
Glutamine	530	220- 900	[Bar chart showing result at ~50th percentile]			
Glycine	2010	480- 4100	[Bar chart showing result at ~80th percentile]			
Aspartate	23	26- 115	[Bar chart showing result at ~10th percentile]			

NEUROLOGICAL MARKERS						
NEUROLOGICAL MARKERS	RESULT μMOLE/24 HRS	REFERENCE RANGE	PERCENTILE			
			2.5 th	16 th	50 th	84 th 97.5 th
Ammonia	19800	11000- 60000	[Bar chart showing result at ~50th percentile]			
Glutamine	530	220- 900	[Bar chart showing result at ~50th percentile]			
Phenylalanine	52	25- 115	[Bar chart showing result at ~50th percentile]			
Tyrosine	140	39- 290	[Bar chart showing result at ~50th percentile]			
Tryptophan	46	20- 140	[Bar chart showing result at ~50th percentile]			
Taurine	1740	320- 1600	[Bar chart showing result at ~80th percentile]			
Cystathionine	18	6- 50	[Bar chart showing result at ~50th percentile]			
Beta-alanine	46	< 18	[Bar chart showing result at ~68th percentile]			

UREA CYCLE METABOLITES						
UREA CYCLE METABOLITES	RESULT μMOLE/24 HRS	REFERENCE RANGE	PERCENTILE			
			2.5 th	16 th	50 th	84 th 97.5 th
Arginine	18	6- 40	[Bar chart showing result at ~50th percentile]			
Aspartate	23	26- 115	[Bar chart showing result at ~10th percentile]			
Citrulline	1.5	1- 32	[Bar chart showing result at ~50th percentile]			
Ornithine	6.1	2- 28	[Bar chart showing result at ~50th percentile]			
Urea	290	100- 800	[Bar chart showing result at ~50th percentile]			
Ammonia	19800	11000- 60000	[Bar chart showing result at ~50th percentile]			
Glutamine	530	220- 900	[Bar chart showing result at ~50th percentile]			
Asparagine	79	50- 230	[Bar chart showing result at ~50th percentile]			

SPECIMEN DATA		
Comments:		
Date Collected: 12/22/2008	Date Received: 12/23/2008	Date Completed: 12/24/2008
Methodology: HPLC	Collection Period: 24 Hr/Co11	Volume: 1450 ml

V07.02



SUPPLEMENTATION SCHEDULE

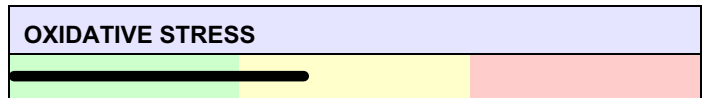
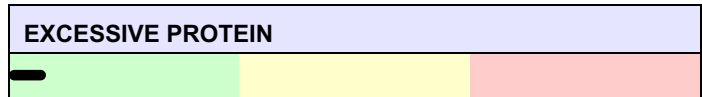
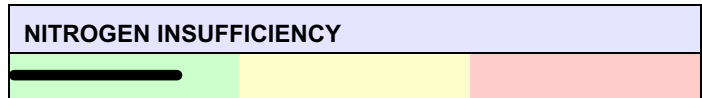
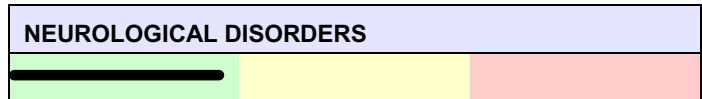
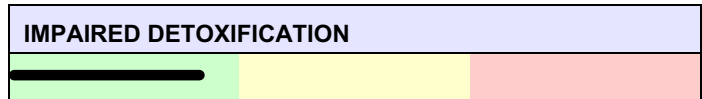
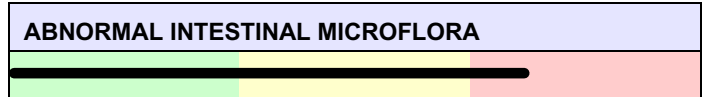
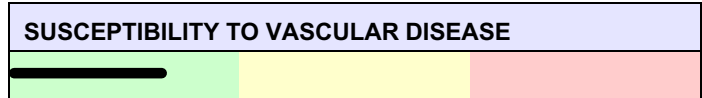
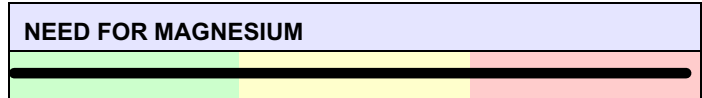
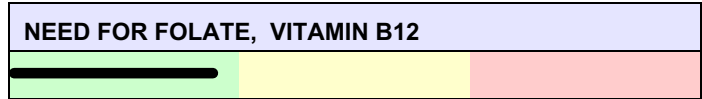
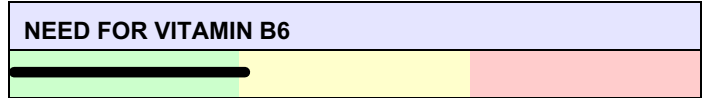
PRESUMPTIVE NEEDS / IMPLIED CONDITIONS

L-configured Amino Acids	Total Daily Oral Dose
Tryptophan	280 mg
Arginine	875 mg
Histidine	690 mg
Isoleucine	1135 mg
Leucine	1200 mg
Lysine	1250 mg
Methionine	720 mg
Phenylalanine	1200 mg
Threonine	755 mg
Valine	1210 mg
Pyridoxal-5-phosphate	30 mg
Alpha-ketoglutarate	650 mg
Taurine	0 mg

The supplement schedule is not intended for use by pregnant females and is strictly contraindicated for individuals with suspected or known renal insufficiency or renal failure.

The levels of one or both dietary peptides anserine and/or carnosine are markedly elevated in this urine specimen, indicating incomplete digestion of anserine-containing meats (chicken, turkey, duck, rabbit, tuna and salmon) and/or carnosine-containing meats (beef, pork, tuna and salmon).

Zinc status should be checked (RBC Elements) since the peptidase activity is zinc dependent. The peptidase activity can also be inhibited by high levels of Beta-alanine, which can result from B-6 insufficiency, or abnormal intestinal flora.



This recommended Amino Acid Supplement Schedule was calculated based upon the difference between the test results for this specific patient and optimal urine levels, and guidelines for human amino acid requirements as provided by the Food and Nutrition Board of the NRC. The schedule has been provided at the request of a licensed medical practitioner and the calculated levels of amino acids only apply to ORAL administration. The supplement schedule is not intended for use by pregnant females and is strictly contraindicated for individuals with suspected or known renal insufficiency or renal failure.

Only pure, L-form crystalline amino acids should be used and the custom formulation should be prepared by credible pharmacies or purveyors who specialize in amino acid formulations. In order to get the full benefit of the amino acid supplementation, one needs to ensure adequate intake of CALORIES and the essential co-factors that permit proper metabolism of the amino acids (eg. B-6, B-12, folate, magnesium). Supplemental cystine or N-acetylcysteine should not be given to patients who have been diagnosed with intestinal candidiasis.

This analysis of amino acids and related metabolites was performed using High Pressure Liquid Chromatography. The test provides fundamental information about the adequacy of dietary protein, digestive disorders, dysbiosis, mood and sleep disorders, and vitamin and mineral deficiencies. When the level of a specific amino acid or metabolite deviates significantly from the norm, an interpretive paragraph is presented which briefly discusses the possible causes, clinical implications and remedies for the metabolic aberrations. If no significant abnormalities are detected, interpretive paragraphs and amino acid supplementation schedules are not provided.

Isoleucine (low)

Isoleucine, an essential amino acid, is low in this urine specimen. Isoleucine is a branched-chain structural amino acid that like leucine and valine is a common component of proteins, peptides and hormones. Leucine is catabolyzed as a source of carbon for energy production during exercise in skeletal muscle. Isoleucine and the other branched chain amino acids can be low as a result of zinc deficiency (zinc dependent intestinal peptidase), protein malnutrition or other gastrointestinal dysfunctions.

Taurine (high)

Taurine, a conditionally essential amino acid, is abnormally high in this urine specimen. Elevated urinary taurine is usually associated with impaired renal conservation (wasting) due to competition by elevated levels of B-alanine (check B-alanine). Excessive levels of B-alanine are commonly associated with dysbiosis (bacterial and/or fungal). However, first rule out oral supplementation of taurine. B-alanine could also accumulate and compete for retention of taurine with a frank B-6 deficiency; in such a case one would also expect to see elevations in other amino acids that require transamination (eg. leucine, isoleucine, valine). Urinary wasting of taurine can be associated with low intracellular taurine that can negatively impact on intracellular electrolytes (magnesium, potassium, calcium, sodium). Taurine accounts for about 50% of the free amino acids in cardiac tissue, therefore taurine deficiency can result in arrhythmias. Taurine is also an important antioxidant, neurotransmitter (CNS), and a component of bile acids (fat and fat soluble vitamin absorption). Taurine is a key scavenger of hypochlorite ions, thus a shortage of taurine after viral or bacterial infections, or exposure to xenobiotics (eg. chlorine,

chlorite, alcohol, aldehydes) can result in excessive inflammation or chemical sensitivity. It can be futile to simply supplement taurine (or magnesium) without correcting the cause of renal wasting of taurine, therefore a Comprehensive Stool Analysis test may be warranted.

Aspartate (low)

Aspartate, a nonessential amino acid, is low in this urine specimen. Aspartate is derived directly from dietary protein and, is also synthesized from glutamate via the B-6 dependent enzyme SGOT. Adequate aspartate is required for proper urea cycle function: in a magnesium dependent reaction, aspartate combines with citrulline to form arginosuccinate. Low urinary aspartate can result from general dietary protein insufficiency, maldigestion, or possibly B-6 deficiency.

Beta-alanine (high)

Beta-alanine, a nonessential intermediary amino acid, is abnormally elevated in this urine specimen. Normally beta-alanine is near completely deaminated to alpha-ketoglutarate (B-6 dependent). Beta-alanine is derived from: (1) the breakdown of DNA/RNA (yeast, pyrimidine, uracil), (2) activity of unusual bacteria on aspartic acid and, (3) the hydrolysis of anserine and carnosine, which are peptides found in beef, pork, poultry, salmon, and tuna. Elevated beta-alanine inhibits the breakdown of anserine and carnosine, and impairs the renal conservation of taurine and beta-aminoisobutyric acid; taurine is an important antioxidant, neurotransmitter and essential for the retention and homeostasis of intracellular magnesium and potassium. Beta-alanine is a neurotoxic substance that suppresses development in the brain and spinal cord. Beta-alanine also interferes with the metabolism of the neuroinhibitory neurotransmitter gamma-aminobutyric acid. Hyper-B- alaninurea has been associated with seizures and somnolence. Patients exhibiting elevated urinary B-alanine should be retested after given a trial on a low-protein, low-pyrimidine diet and high B-6 (P-5-P). Elevated levels of B-alanine are highly correlated with gastrointestinal and genitourinary infections in patients with Chronic Fatigue Syndrome. Intestinal dysbiosis, especially candidiasis, should be evaluated via a Comprehensive Stool Analysis.

Carnosine (high)

Carnosine, a dietary peptide, is high in this urine specimen. Carnosine is an incompletely digested peptide that is derived primarily from beef and pork. Carnosine consists of histidine and beta-alanine. Breakdown of the peptide requires a zinc dependent peptidase, which can be inhibited by high levels of the "end product" beta-alanine. Beta-alanine can accumulate if deamination of beta-alanine to alpha-ketoglutarate is impaired due to B-6 insufficiency. Therefore, carnosine can accumulate as a result of high intake of carnosine containing meats with insufficient zinc and/or B-6 availability. Beta-alanine can also be elevated as a product of gastrointestinal bacterial conversion of aspartate and/or breakdown of pyrimidines that are high in yeast. Thus beta-alanine can accumulate and inhibit hydrolysis of carnosine as a result of significant dysbiosis, or deficiencies of B-6 and/or zinc. Beta-alanine can have adverse effects in the central nervous system, but more commonly elevated levels of beta-alanine inhibit renal conservation of the amino acid taurine which is an important antioxidant,

neurotransmitter and essential for the retention and metabolism of intracellular magnesium and potassium. If urinary taurine is either low or high, magnesium deficiency is likely or pending. Comprehensive Stool Analysis (yeast/bacteria), Red Blood Cell Elements Analysis (zinc, potassium, and magnesium) and assessment of B-6 status are useful to identify the cause and potential consequences of the inability to break down this dietary peptide.

Phosphoserine (high)

The nonessential amino acid phosphoserine is abnormally high in this urine specimen. Phosphoserine is derived directly from dietary sources, and metabolically as an intermediary metabolite from glycolysis and gluconeogenesis. Towards gluconeogenesis, phosphoserine is deaminated via a B-6 dependent enzyme. Towards glycolysis, phosphoethanolamine is converted to serine via a magnesium dependent enzyme. Therefore, elevated phosphoserine can be caused by inadequate assimilation of magnesium or insufficient P-5-P activity (or both). A third possible cause is a disorder in phosphate metabolism. This would be accompanied by elevated phosphoethanolamine (check for elevated phosphoethanolamine). Phosphoserine may also be elevated, along with phosphoethanolamine, as a result of parathyroid dysfunction.

Methionine sulfoxide (High)

Methionine sulfoxide, an abnormal toxic metabolite, is high in this urine specimen. Usually this is indicative of magnesium deficiency since the first enzymatic step in methionine metabolism (formation of s-adenosylmethionine) requires magnesium. However, this is not certain and other steps in methionine metabolism may be impaired. Check serine, intracellular magnesium (Red Blood Cell Elements) and B-6 status.