Test requistion # 493702 Physician : DR. MARCELO VANUCCI LEOCÁDIO

DNA life

LAB#: U170410-2225-1
PATIENT: Joao Pedro de Moraes Bortolotti
SEX: Male
AGE: 3
CLIENT#: 24510

Amino Acids; Urine

SPECIMEN VALIDITY	RESULT per creatinine	REFERENCE INTERVAL	PERCENTILE 2.5th 16th 50th 84th 97.5th
Creatinine	**63 mg/dL**	15 - 120	
Glutamine/Glutamate	**8.7**	3 - 120	
Ammonia Level (NH_4)	**71100 µM/g**	18000 - 100000	
Specimen Validity Index			

ESSENTIAL / CONDITIONALLY INDISPENSABLE AMINO ACIDS	RESULT µM/g creatinine	REFERENCE INTERVAL	PERCENTILE 2.5th 16th 50th 84th 97.5th
Methionine	**13**	15 - 80	
Lysine	**150**	80 - 600	
Threonine	**120**	80 - 400	
Leucine	**63**	16 - 120	
Isoleucine	**21**	7 - 50	
Valine	**72**	30 - 150	
Phenylalanine	**170**	50 - 300	
Tryptophan	**120**	40 - 200	
Taurine	**810**	250 - 2500	
Cysteine	**42**	48 - 190	
Arginine	**32**	15 - 100	
Histidine	**1280**	700 - 2300	

NONESSENTIAL AMINO ACIDS	RESULT µM/g creatinine	REFERENCE INTERVAL	PERCENTILE 2.5th 16th 50th 84th 97.5th
Alanine	**390**	250 - 1200	
Aspartate	**14**	7 - 35	
Asparagine	**160**	80 - 480	
Glutamine	**410**	230 - 900	
Glutamate	**47**	25 - 150	
Cystine	**35**	33 - 120	
Glycine	**1190**	630 - 4000	
Tyrosine	**220**	68 - 285	
Serine	**250**	135 - 720	
Proline	**11**	4 - 100	

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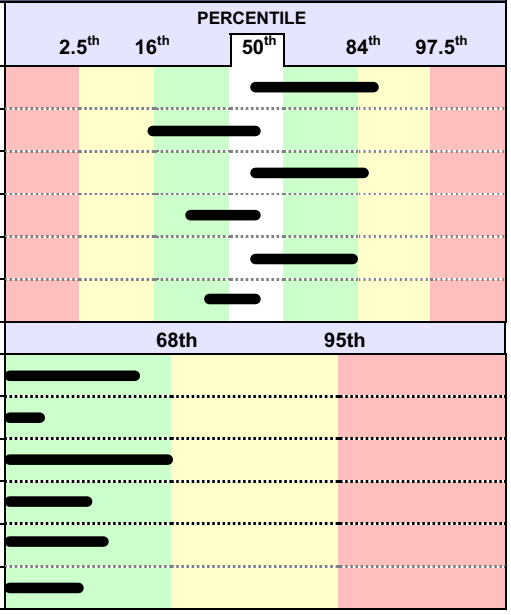
GASTROINTESTINAL MARKERS

	RESULT µM/g creatinine	REFERENCE INTERVAL
Ammonia (NH_4)	**71100**	18000-100000
Ethanolamine	**310**	180- 700
Alpha-Aminoadipitate	**90**	18- 150
Threonine	**120**	80- 400
Tryptophan	**120**	40- 200
Taurine	**810**	250- 2500

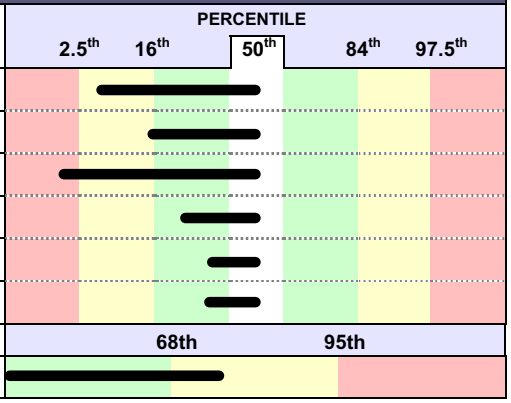
Beta-alanine	**3.2**	< 20
Beta-aminoisobutyrate	**48**	< 700
Anserine	**57**	< 900
Carnosine	**74**	< 500
Gamma-aminobutyrate	**2.1**	< 12
Hydroxyproline	**11**	< 65



MAGNESIUM DEPENDANT MARKERS

	RESULT µM/g creatinine	REFERENCE INTERVAL
Citrulline	**6.5**	1- 85
Ethanolamine	**310**	180- 700
Phosphoethanolamine	**48**	65- 170
Phosphoserine	**0.27**	0.09- 1.5
Serine	**250**	135- 720
Taurine	**810**	250- 2500

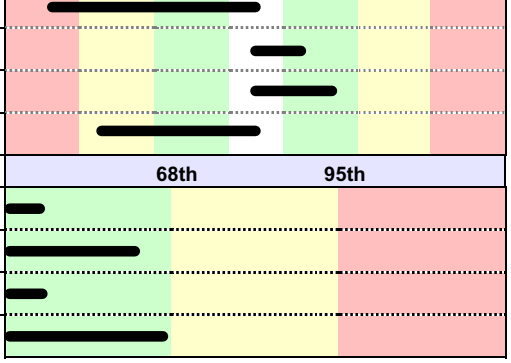
Methionine Sulfoxide	**9.7**	< 20



B6, B12, & FOLATE DEPENDANT MARKERS

	RESULT µM/g creatinine	REFERENCE INTERVAL
Serine	**250**	135- 720
Alpha-aminoadipate	**90**	18- 150
Cysteine	**42**	48- 190
Cystathionine	**8.7**	15- 50
1-Methylhistidine	**310**	115- 430
3-Methylhistidine	**820**	80- 1500
Alpha-amino-N-butyrate	**18**	16- 100

Beta-aminoisobutyrate	**48**	< 700
Beta-alanine	**3.2**	< 20
Homocystine	**0.12**	< 1
Sarcosine	**0.98**	< 20



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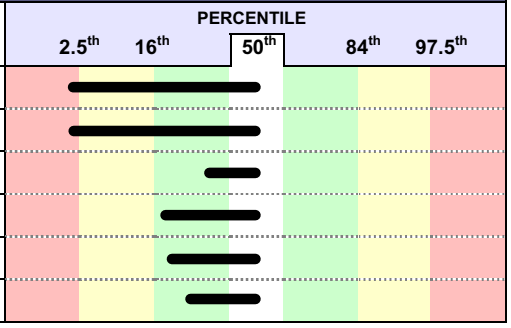
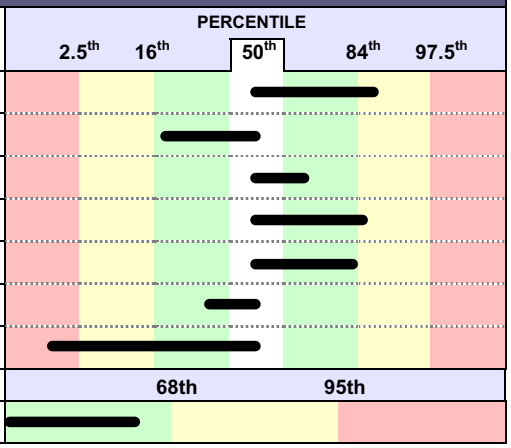
DETOXIFICATION MARKERS

	RESULT µM/g creatinine	REFERENCE INTERVAL
Methionine	**13**	15 - 80
Cysteine	**42**	48 - 190
Taurine	**810**	250 - 2500
Glutamine	**410**	230 - 900
Glycine	**1190**	630 - 4000
Aspartate	**14**	7 - 35



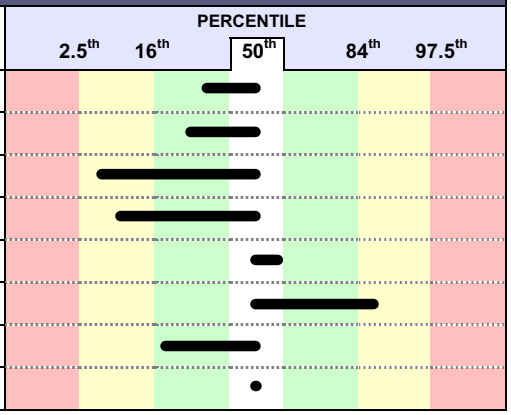
NEUROLOGICAL MARKERS

	RESULT µM/g creatinine	REFERENCE INTERVAL
Ammonia (NH_4)	**71100**	18000 - 100000
Glutamine	**410**	230 - 900
Phenylalanine	**170**	50 - 300
Tyrosine	**220**	68 - 285
Tryptophan	**120**	40 - 200
Taurine	**810**	250 - 2500
Cystathionine	**8.7**	15 - 50
Beta-alanine	**3.2**	< 20



UREA CYCLE METABOLITES

	RESULT per creatinine	REFERENCE INTERVAL
Arginine	**32 µM/g**	15 - 100
Aspartate	**14 µM/g**	7 - 35
Citrulline	**6.5 µM/g**	1 - 85
Ornithine	**10 µM/g**	8 - 85
Urea	**640 mM/g**	300 - 890
Ammonia (NH_4)	**71100 µM/g**	18000 - 100000
Glutamine	**410 µM/g**	230 - 900
Asparagine	**160 µM/g**	80 - 480



SPECIMEN DATA

Comments:

Date Collected: **03/21/2017**
Date Received: **04/10/2017**
Date Completed: **04/17/2017**

Collection Period: **Random**
Volume:

Methodology: **LC MS/MS**
NH_4, Urea, Creatinine by Automated Chem Analyzer

v3

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.

”Presumptive Needs” are not the result of direct analyses of B vitamins or magnesium but are based upon algorithms that utilize levels of specific amino acids (AA) and intermediary metabolites that may be abnormal if nutrient cofactors limit normal AA metabolism. Direct testing for B vitamins and magnesium (Red Blood Cell Elements) may be warranted. ”Implied conditions” may infer further clinical evaluation, functional testing and direct laboratory testing (e.g. Comprehensive Stool Analysis, Cardiovascular Risk Profile, DNA Oxidative Damage, Methylation Profile).

Creatinine

The urinary creatinine concentration (CC) presented in this report represents the actual creatinine concentration in the specimen that was submitted. Under normal conditions, the rate of excretion of creatinine is quite constant and highly correlated with lean body mass (muscle). However, the CC can vary significantly as a function of urine volume. An unusually high CC most likely indicates poor hydration of the patient at the time of the urine collection. A very low CC most likely indicates unusually high fluid consumption, or perhaps the influence of diuretics. If the urine specimen is very dilute (extremely low CC), the accuracy of the amino acid analysis may be compromised due to analytical detection limits. It is emphasized that the CC in this specimen should not be utilized to assess renal function or glomerular filtration. For that purpose, one should perform a bona fide creatinine clearance test.

For a given age and gender, intra-individual variability in daily creatinine excretion can vary by as much as two-fold. Therefore, to more accurately assess amino acid status using a random collection, the reported values for each analyte are expressed per gram ”normalized” creatinine. Creatinine values are adjusted to account for body surface area (BSA) using the formula:

CreatinineN (Normalized) = creatinine concentration x (1.73/BSA).

Methionine (low)

Methionine, an essential amino acid, is low in this urine specimen. Methionine is a precursor of other important amino acids and metabolites. Cysteine and taurine are derived in part from methionine. Cysteine is the rate limiting amino acid in the endogenous production of glutathione, a predominant amino acid in metallothionein, and is required for the production of Coenzyme A that is involved in fatty acid metabolism and the Krebs cycle. Taurine is an important antioxidant, a component of bile, a neurotransmitter, and very importantly, an osmoregulator that facilitates the intracellular retention of magnesium and potassium. Methionine also serves as a methyl donor (serine, creatine, epinephrine). Methionine deficiency can result in fatty liver and decreased

capacity for endogenous detoxification of sulfhydryl reactive metals and xenobiotics. Symptoms that may be associated with insufficient methionine include inflammation, headaches, fatigue, biliary insufficiency, occlusive arterial disease, myopia and skeletal disorders. Animal products, as well as almonds and cashews are a good dietary sources of methionine. Supplementation with methionine should be accompanied with magnesium, B-6, folate and B-12.

Cysteine (low)

Cysteine, the reduced and reactive form of cystine is low in this urine specimen. Cysteine is required for the formation of coenzyme A, proteins with cross-linked polypeptide chains (eg. insulin), metallothionein, and enzymes with active sulfhydryl (SH-) groups (eg. glutathione peroxidase, Na/ K ATPase). Cysteine is the rate limiting amino acid for the formation of intracellular glutathione, which is one of the most important endogenous antioxidants and detoxifying (metals and chemicals) molecules in the body. Cysteine may be low due to: (1) chronic exposure to sulfhydryl reactive metals (eg. mercury, cadmium, arsenic), or toxic chemicals, (2) oxidative stress or insufficient antioxidants (vitamins E and C), (3) inflammation, (4) methionine insufficiency or impaired methionine metabolism (inadequate folic acid, B-12, B-6, magnesium), or (5) cysteinurea or hypertaurinurea. Supplementation with N-acetyl cysteine may be beneficial except in cystinurea, intestinal candidiasis or insulin-dependent diabetes. Undenatured whey protein and eggs are excellent dietary sources of cysteine.

Phosphoethanolamine (low)

Phophoethanolamine, a nonessential phosphorous bearing amino acid, is low in this urine specimen. Phosphoethanolamine is derived from dietary sources and is also formed endogenously from serine via phosphorylation of ethanolamine. When ethanolamine is high or normal and phosphoethanolamine is low there is a presumptive need for magnesium (magnesium dependent kinase). Phosphoethanolamine is a precursor of phosphotidyl choline, choline and the neurotransmitter acetylcholine. If low phosphoethanolamine results in low acetylcholine, and there is insufficient choline from dietary lecithin, there may be depressed activity of the parasympathetic nervous system (eg. decreased peristalsis, ability to sweat), and poor memory and cognitive function. Low phosphoethanolamine is usually the result of magnesium deficiency or protein malnutrition.

Cystathionine (low)

Cystathionine is low in this urine specimen. Cystathionine is an intermediary metabolite that is formed in the sequential enzymatic conversion of methionine (essential amino acid) to cysteine. Serine and B-6 are required to produce cystathionine from homocysteine. Subnormal cystathionine is usually a nutritional condition that is readily corrected by adequate provision of serine and B-6/P-5-P. If dietary cysteine intake is concomitantly insufficient, there could also be a cysteine deficiency that could be associated with subnormal intracellular glutathione and decreased antioxidant and detoxification (chemical and heavy metal) capacity.