NutriPATH
Integrative Pathology Services
P: 1300 688 522
E: info@nutripath.com.au
A: PO Box 442 Ashburton VIC 3142

TEST PATIENT
Sample Test Name
Sex : F
Date Collected : 00-00-0000
111 TEST ROAD TEST SUBURB
LAB ID: 00000000 UR#:0000000

TEST PHYSICIAN
DR JOHN DOE
111 CLINIC STREET
CLINIC SUBURB VIC 3000

INTEGRATIVE MEDICINE

URINE, 24 HOUR	Result	Range	Units
Total Branched Chain AAs	*311* *L	424 - 557	umol/L
GABA	<1.0	0.0 - 1.0	mmol/molCr
Hydroxylysine	2.2	2.0 - 5.0	umol/L
AMINO ACIDS, Urine.			
24hr Urine Volume	3250	693 - 3741	mL
Creatinine Concentration	1385.0	600.0 - 2000.0	mg/24hr
Specimen Validity			
24hr Urinary Ammonia	34200	11000 - 60000	umol/24h
Glutamine/Glutamate	*0.3* *L	5.0 - 160.0	RATIO
Taurine, Urine	*88.3* *H	16.0 - 80.0	mmol/molC
Threonine, Urine	*<1.0* *L	7.0 - 29.0	mmol/molC
Valine, Urine	*1.8* *L	3.0 - 13.0	mmol/molC
Cysteine, Urine	*<1.0* *L	3.0 - 17.0	mmol/molC
Methionine, Urine	2.1	2.0 - 16.0	mmol/molC
Isoleucine, Urine	1.9	0.0 - 4.0	mmol/molCr
Leucine, Urine	*<1.0* *L	2.0 - 11.0	mmol/molC
Phenylalanine, Urine	*<1.0* *L	2.0 - 19.0	mmol/molC
Histidine, Urine	*23.8* *L	26.0 - 153	mmol/molC
Tryptophane, Urine	<1.0	0.0 - 7.0	mmol/molCr
Arginine, Urine	<1.0	0.0 - 5.0	mmol/molCr
Lysine, Urine	10.1	7.0 - 58.0	mmol/molC
Aspartate, Urine	*1.3* *L	2.0 - 7.0	mmol/molC
Hydroxyproline, Urine	<1.0	< 13.0	mmol/molCr
Serine, Urine	*<1.0* *L	21.0 - 50.0	mmol/molC
Asparagine, Urine	<1.0	0.0 - 23.0	mmol/molCr
Glutamate, Urine	10.6	0.0 - 12.0	mmol/molCr
Glutamine, Urine	*2.9* *L	20.0 - 76.0	mmol/molC
Proline, Urine	<1.00	0.00 - 9.00	mmol/molCr
Glycine, Urine	*41.0* *L	43.0 - 173	mmol/molC
Alanine, Urine	*10.2* *L	16.0 - 68.0	mmol/molC
Tyrosine, Urine	*<1.0* *L	2.0 - 23.0	mmol/molC
Citrulline, Urine	<1.00	< 4.00	mmol/molCr
Ornithine, Urine	<1.0	< 5.0	mmol/molCr
1 Methyl Histidine, Urine	*334* *H	< 40.0	mmol/molCr
3 Methyl Histidine, Urine	23.2	18.0 - 47.0	mmol/molC

(*) Result outside normal reference range (H) Result is above upper limit of reference rang (L) Result is below lower limit of reference range

NutriPATH
Integrative Pathology Services
P: 1300 688 522
E: info@nutripath.com.au
A: PO Box 442 Ashburton VIC 3142

TEST PATIENT
Sample Test Name
Sex : F
Date Collected : 00-00-0000
111 TEST ROAD TEST SUBURB
LAB ID: 00000000 UR#:0000000

TEST PHYSICIAN
DR JOHN DOE
111 CLINIC STREET
CLINIC SUBURB VIC 3000

Amino Acids Comment

Glutamine/Glutamate LOW
The low glutamine : glutamate ratio in this specimen may indicate specimen decay. When aged, warmed or improperly preserved, urine glutamine readily breaks down to glutamate and ammonia, hence the test results may not be truly representative for this patient. However, high levels of glutamate can be associated with gout or metabolic acidosis, and thereby are not an indication of specimen decay. Likewise, chronic alcoholism and negative nitrogen balance are associated with physiologically low levels of glutamine.

Histidine Low - check dietary protein, or malabsorption if other essential AAs are low. Low histidine is associated with rheumatoid arthritis and folate deficiency.
Treatment: Folate 800mcg; Histidine 500mg TID.

Leucine Low - potential catabolism of skeletal muscle. Check 3-methylhistidine to confirm this.
Treatment: Use a balanced or custom mixture of essential amino acids,

Phenylalanine Low - can result in altered thyroid function and catecholamine deficits including symptoms of depression, cognitive disorders, memory loss, fatigue, and autonomic dysfunction. Reduce lifestyle stressors and supplement phenylalanine.
Treatment: Use a balanced or custom mixture of essential amino acids,

Threonine Low - can result in hypoglycemic symptoms, particularly if glycine or serine is also low.
Threonine is the precursor of serine and glycine, and is required in the formation of glycoproteins that are essential in immune function. Threonine is slowly absorbed and is often low as a result of rapid transit time, maldigestion or insufficient quality or quantity of dietary protein.
Meats, poultry, fish, some nuts and peanuts and, cheeses are good sources of Threonine.
Treatment: Use a balanced or custom mixture of essential amino acids,

Tryptophan Low - commonly correlated with depression, insomnia, and schizophrenia. Supplementation with 5-hydroxy-tryptophan (5-HTP) may help. 5-HTP is one enzymatic step away from serotonin.
Treatment: 5HTP 50mg TID.

Valine Low - deficiency in this or other BCAAs indicates potential muscle loss. If several essential Amino Acids (AAs) are low, check for adequate stomach acid.
Treatment: Supplement the BCAAs.

Glycine Low - possible generalized tissue loss, glycine being part of the nitrogen pool and important in gluconeogenesis. Supplement glycine.
Treatment: Glycine 1000mg TID.

Serine Low - can lead to disordered methionine metabolism and deficits in acetylcholine synthesis. If simultaneous high threonine or phosphoserine, then need for vitamin B6, folate, and manganese is indicated.
Serine is plentiful in dietary protein and is also formed endogenously from dietary phosphoserine (magnesium dependent), glycine and threonine. In addition, serine is derived from glycolysis provided that the status of B-6 and magnesium are good. Serine is also required for proper metabolism of methionine; a blatant serine deficiency would be expected to be associated with low cysteine and cystathionine and, homocystinurea (elevated plasma homocysteine). Elevated phosphoserine: serine is a good indicator of functional magnesium insufficiency. Low urinary serine is usually

NutriPATH
Integrative Pathology Services
P: 1300 688 522
E: info@nutripath.com.au
A: PO Box 442 Ashburton VIC 3142

associated with insufficient protein intake or malabsorption or magnesium deficiency.
Treatment: B6 100mg; Mn 15mg; Folate 800mcg.

Taurine High - may be due to excessive inflammation in the body or to supplementation of other amino acids.
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 dysbyosis (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.
Treatment: Vit E 800IU; Vit C 1g TID; b-carotene 25,000 IU; CoQ10 30mg; Lipoate.

Tyrosine Low - implicated in depression, hypothyroidism, and blood pressure disorders. If phenylalanine is normal or high (barring PKU), iron, vitamin C, and niacin supplementation might be indicated to help convert phenylalanine to tyrosine.
Treatment: Iron 30mg; Tyrosine 500mg TID, Vit C 1g BID; Niacin 50mg.

Asparagine Low - can reflect functional need for magnesium in the conversion from aspartic acid. Supplement magnesium.
Treatment: Mg 200mg BID.

Aspartate Low - inhibits ammonia detoxification in the urea cycle. Can be converted to oxaloactetate using B6 and a-KetoGluterate and thus enter the Krebs cycle. Low levels can reflect decreased cellular energy generation, seen as fatigue. Citric and aspartic acids can drive the Krebs (citric acid) cycle, when combined with B6 and a-KetoGluterate.
Treatment:a-KetoGluterate 600mg BID; B6 100mg.

Glutamine Low - deficient intake or absorption of essential amino acids (glutamine is derived from histidine). Check overall amino acid level of diet.
Glutamine is derived directly from dietary protein, and also formed endogenously by addition of ammonia to glutamate. In the CNS the formation of glutamine from glutamate provides a disposal mechanism that protects against excess accumulation of cytotoxic ammonia.
Low glutamine can be a result of protein malnutrition or negative nitrogen balance, incomplete digestive proteolysis or other malabsorption syndromes, or chronic alcoholism. Glutamine can also be low as a result of renal acidosis (low pH, high H+ ion concentration) that is associated with increased renal glutaminase activity and

NutriPATH
Integrative Pathology Services
P: 1300 688 522
E: info@nutripath.com.au
A: PO Box 442 Ashburton VIC 3142

TEST PATIENT
Sample Test Name
Sex : F
Date Collected : 00-00-0000
111 TEST ROAD TEST SUBURB
LAB ID: 00000000 UR#:0000000

TEST PHYSICIAN
DR JOHN DOE
111 CLINIC STREET
CLINIC SUBURB VIC 3000

increased ammonia excretion.
Glutamine can also be artifactualy low as a result of sample decay in which glutamine is broken down to glutamate and ammonia as a result of improper preservation of the urine specimen.

Cystine Low - possible dietary deficiency of methionine and/or cystine. Low cystine can impair Taurine synthesis.
Treatment: N-Acetyl Cystine (NAC) 500mg BID.

Alanine Low - may point to hypoglycemic conditions because of its role in gluconeogenesis. Supplement with alanine and the branched chain amino acids leucine, isoleucine and valine.
Treatment: Use a balanced or custom mixture of essential amino acids,

Tests ordered: AAUr