Neuro Basic Profile; urine

Order: HOR11 Sample Report-
Client #: 38596
Regenerus Laboratories Ltd
Aero 14 Redhill Aerodrome Kings Mill Lane
Redhill, Surrey, RH1 5YP
United Kingdom

HOR11 Sample Report
Age: 47 **DOB:** 06/10/1972
Sex: Female

Sample Collection	Date/Time
Date Collected	07/02/2019
Wake Up Time	04:30
Collection Period	1st morning void
Date Received	07/05/2019
Date Reported	07/10/2019

Analyte	Result	Unit per Creatinine	L WRI H	Reference Interval
Serotonin	70.7	µg/g		60 – 125
Dopamine	153	µg/g		125 – 250
Norepinephrine	18.2	µg/g		22 – 50
Epinephrine	1.0	µg/g		1.6 – 8.3
Norepinephrine / Epinephrine ratio	18.2			< 13
Glutamate	29	µmol/g		12.0 – 45.0
Gamma-aminobutyrate (GABA)	3.1	µmol/g		2.0 – 5.6
Glycine	1212	µmol/g		450 – 2200
Histamine	16	µg/g		14 – 44
Phenethylamine (PEA)	59	nmol/g		32 – 84
Creatinine	44.4	mg/dL		30 – 225

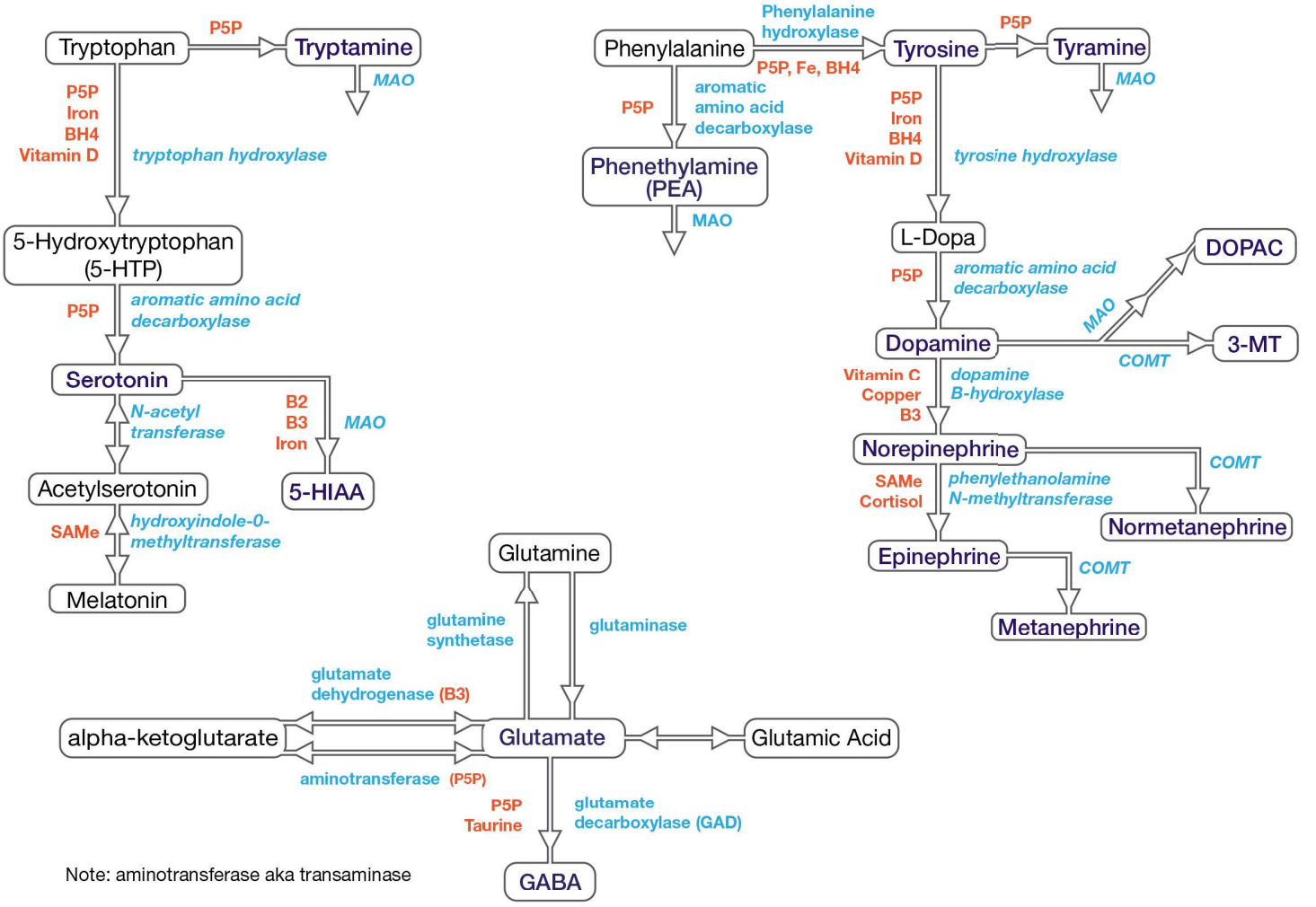
Neurotransmitter Comments:

- Urinary neurotransmitter levels provide an overall assessment of the body's ability to make and break down neurotransmitters and are representative of whole body levels. They are required for neurotransmission throughout the body. Direct assessment of neurotransmitter levels and metabolism in the central nervous system is not clinically feasible and approximately twenty percent of the total urinary levels are derived from the brain. The enzymes, cofactors and precursors in neurotransmitter metabolism in general are the same in the periphery and in the central nervous system. Therefore, alterations in urinary neurotransmitter levels assessed in urine provide important clinical information, and may be associated with many symptoms including cognitive and mood concerns, diminished drive, fatigue and sleep difficulties, cravings, addictions and pain.
- Low range serotonin may contribute to mood concerns including anxiety, OCD, depression, anger and a sense of discontentment. Low range serotonin may also be associated with poor sleep quality and appetite changes. as well as chronic fatigue, rheumatoid arthritis, and over-all lassitude. Failure to regenerate tetrahydrobiopterin [BH4], an essential cofactor for serotonin synthesis, may decrease serotonin levels, and could be reflected in urine. BH4 regeneration may be supported by folates, vitamin B3, C, molybdenum and zinc. Additionally, production of serotonin requires vitamin D, iron and vitamin B6. Tryptophan is the essential precursor of serotonin. 5-HTP may increase serotonin, and L-theanine may affect serotonin function.
- Low range dopamine may be associated with anxiety/depression, difficulty concentrating, decreased libido and obesity, and may be associated with increased addiction and other stimulation seeking activities. Failure to regenerate tetrahydrobiopterin [BH4], an essential cofactor for dopamine synthesis, may decrease dopamine levels, and could be reflected in urine. BH4 regeneration may be supported by folates, vitamin B3, C, molybdenum and zinc. Additionally, production of dopamine requires vitamin D, iron and vitamin B6. L-tyrosine, L-theanine and Mucuna pruriens may influence dopamine signaling.
- Low norepinephrine and low epinephrine may be associated with depression and mood changes as well as fatigue, difficulty concentrating, decreased ability to stay focused on tasks and diminished sense of personal/professional drive. Norepinephrine is converted from dopamine requiring vitamin C, copper and niacin (B3). L-tyrosine, L-theanine and Mucuna pruriens influence this pathway.
- Elevated N/E ratio is consistent with poor conversion of norepinephrine to epinephrine. This conversion is driven by the phenylethanolamine N-methyltransferase (PNMT) enzyme that requires SAMe, magnesium and cortisol (adequate HPA axis function) as cofactors. Suggest interpretation in context of cortisol levels/HPA axis function, with subsequent optimization of HPA axis function when clinically warranted.
- Note: The reported low to low range monoamine neurotransmitters may be associated with genetic disruptions in methylation and/or suboptimal quantities of required co-factors. Further testing may be warranted.
- Considerations to address the demonstrated imbalances beyond the identified co-factors and amino acid precursors may include dosage adjustments if indicated, as well as nervine and adaptogenic herbs, methylation support, vitamin D, and gastrointestinal health optimization.

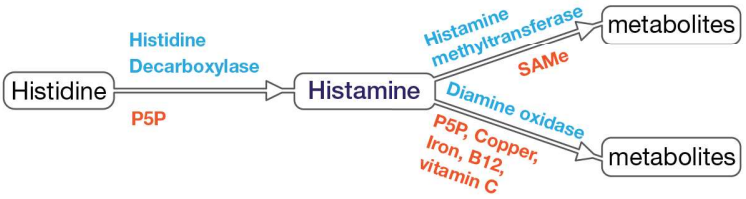
Notes:
Results are creatinine corrected to account for urine dilution variations. Creatinine is not meant to be used as an indicator of renal function.
RI= Reference Interval, L (blue)= Low (below RI), WRI (green)= Within RI (optimal), WRI (yellow)= Within RI (not optimal), H (red)= High (above RI)
Methodology: LCMS QQQ, Creatinine by Jaffe Reaction

Analyzed by DOCTOR'S DATA, INC. • 3755 Illinois Avenue, St. Charles, IL 60174-2420 USA • LAB DIR: Erlo Roth, MD • CLIA ID: 14D0646470

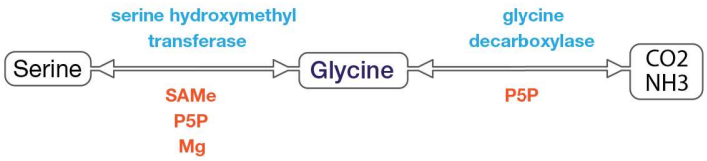
Neurotransmitter Pathways



Note: aminotransferase aka transaminase



"glycine cleavage system"



KEY

MAO = monoamine oxidase
Cofactors for *MAO*: **B2, B3, P5P, Fe, Mg**
COMT = catechol-o-methyl-transferase
Cofactors for *COMT*: **SAMe, Mg**
P5P = (pyridoxal-5-phosphate) activated form of vitamin B6
BH4 = (tetrahydrobiopterin)
Endogenous levels can be supported with SAMe, vitamin B3, C, Mo, Zn
MTHF = (methyltetrahydrofolate) active form of folate.
SAMe = endogenous levels can be supported with Mg, MTHF, and methylcobalamin supplementation.

Cofactors = Enzymes =