



Date of Birth : 31-Oct-1973
 Sex : M
 Collected : 18-Aug-2016

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

INTEGRATIVE MEDICINE

URINE, SPOT

Result Range Units

EXTENSIVE NEUROTRANSMITTER PROFILE

Inhibitory Neurotransmitters

SEROTONIN Urine	105.0	50.0 - 250.0	ug/gCR	
GABA, Urine	135.9 *L	150.0 - 700.0	ug/gCR	

Excitatory Neurotransmitters

DOPAMINE, Urine	104.1	100.0 - 350.0	ug/gCR	
NORADRENALIN (Nor-Epinephrine)	19.8	13.0 - 70.0	ug/gCR	
ADRENALIN (Epinephrine)	4.4	3.0 - 20.0	ug/gCR	
GLUTAMATE Urine	3.2	2.0 - 12.0	ug/gCR	

Adrenal Adaptation Index

Noradrenalin/Adrenalin Ratio	4.5	< 10.0	RATIO	
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Optimal Ranges Table

Biomarker Adult Optimal Range (>11 Yrs)

Serotonin	200 - 415	ug/gCr
GABA	600 - 1100	ug/gCr
DOPAMINE	250 - 400	ug/gCr
Noradrenaline	30 - 50	ug/gCr
Adrenaline	10 - 15	ug/gCr
Glutamate	5 - 10	ug/gCr

There are multiple factors that play roles in neurotransmitter levels (Lifestyle, receptors, meds, supplements, diet, stress, etc). The optimal reference ranges stated above have been determined/derived statistically from historical patient data. Historically, these levels were achieved in the majority of patients as they experienced symptom relief or improvement.

(*) Result outside normal reference range

(L) Result is below lower limit of reference range



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COMMUNICATION SYSTEM MODEL (CSM)

THE CSM AND YOUR PATIENT

The Communication System Management Model is designed to give you an analysis of neurotransmitter and adrenal hormone values and an observation of how they affect one another. This approach targets the underlying cause of chronic symptoms by addressing the root imbalance. In the next section, we will observe trends in the lab values, correlating those with the symptoms that were marked by the patient.

The patient has indicated the use of a pharmaceutical/supplement that may be affecting the results.

Inhibitory neurotransmitters serotonin and GABA work synergistically to promote optimal sleep, relaxation, and a sense of well-being. The patient reported anxiety, nervousness, irritability, depression, and insomnia/poor sleep that may correlate with low laboratory values of GABA and serotonin. Inhibitory support is recommended to potentially alleviate these symptoms and begin rebalancing the HPA axis. Additionally, inositol has been shown to be beneficial for patients with anxiety and mood concerns; therefore, an inositol-containing supplement is recommended to address the patient's symptoms. The laboratory values show low dopamine, norepinephrine, epinephrine, and glutamate that may relate to fatigue, decreased stamina, depression with exhaustion, poor memory, and poor focus. These excitatory neurotransmitters are necessary for energy, motivation, and cognitive function, including memory and attention. Additionally, low dopamine may correlate with this patient's excessive appetite, as adequate dopamine is required for satiety. Excitatory support is recommended once inhibitory function improves. Anxiety, insomnia, poor focus, fatigue, and decreased stamina are associated with adrenal dysfunction; consider a comprehensive adrenal hormone assessment for further insight into these concerns. Retesting for this patient is recommended in six weeks to best monitor the rebalancing process and make necessary adjustments to therapeutic protocol.

ADRENAL INFLUENCES

Although the patient chose to only test neurotransmitter levels, an adrenal panel is suggested should any of the following symptoms arise: allergies, symptoms of hypoglycemia (shakiness when a meal is skipped), decreased stamina, fatigue, insulin resistance (sugar cravings, fatigue, abdominal weight gain, poor sleep), decreased libido, stress, salt cravings, which are all related to low adrenal function.

INHIBITORY NEUROTRANSMITTERS

Patient indicated symptoms of ANXIETY, NERVOUSNESS, and IRRITABILITY, which are often the result of decreased inhibitory neurotransmission and/or excess excitatory neurotransmission. Additionally, in the presence of up-regulated adrenal function, anxiety, irritability, and/or nervousness may also be present; therefore, consider assessing adrenal hormone levels. As the main inhibitory neurotransmitters, GABA, glycine, and serotonin function to promote calm and prevent over excitation. As GABA is the primary inhibitory neurotransmitter, it can be thought of as "the great balancer" of the nervous system. Also, serotonin often functions as a modulator of GABA activity. Low serotonin or depletion of GABA alone may cause anxiety. Research indicates that inositol and glycine supplementation may be beneficial for those suffering from anxiety, especially acute anxiety and panic disorders. Avoid supporting excitatory neurotransmitter function before restoring serotonin and GABA levels. When up-regulated, thyroid hormones may also generate feelings of nervousness, irritability, and anxiety for the patient; therefore, consider a comprehensive thyroid hormone assessment.

The patient has indicated problems with SLEEP. The low or low normal serotonin is

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likely contributory because adequate levels of serotonin are necessary for restful sleep. In addition, serotonin is the biochemical precursor to melatonin, another very important sleep hormone. High excitatory levels may also contribute to sleep concerns, such as elevated norepinephrine, epinephrine, dopamine, glutamate, and/or cortisol. Therefore, consider assessing adrenal hormone levels, to assure cortisol is not elevated. GABA levels must also be adequate since serotonin serves as a modulator for GABA at the receptor level. That is, without adequate GABA, serotonin cannot function optimally. Most of the new generation sleep medications are GABA receptor agonists. In cases of SAD (seasonal affective disorder), serotonin is being utilized at a much higher rate to produce melatonin due to the shorter days and less daylight. Serotonin stores deplete more quickly during the winter months. Serotonin support in this patient, as well as melatonin support, may be warranted. Individuals with thyrotoxicosis often present hypermetabolic features; therefore, consider assessing thyroid hormone levels.

EXCITATORY NEUROTRANSMITTERS

Patient has indicated UNINTENTIONAL WEIGHT LOSS on the questionnaire. Consider comprehensive history, physical, and lab assessment for underlying causes (including but not limited to: inadequate caloric intake, diabetes, hyperthyroidism, cancer, etc.)

Patient indicated excess APPETITE. The appetite control center is located in the hypothalamus. Imbalances in the Appetite Regulating Network (ARN) (made up of complex signals from hormones, neurotransmitters, and neuropeptides) can lead to overweight and obesity. A multi-factorial approach is needed for achieving balance. The interrelationship between white adipose tissue (WAT), neurotransmitters such as serotonin and dopamine, and ARN hormones like cortisol, ghrelin, and leptin contribute to hunger signals or satiation. Low serotonin levels can increase cravings, especially for carbohydrates. Sufficient dopamine is necessary for a feeling of satiation. Chronic stress can lead to elevated cortisol, which can decrease serotonin, suppress thyroid hormones, and increase levels of ghrelin, thus increasing appetite. Elevated cortisol levels may also interfere with proper sleep. This can allow ghrelin levels to rise and appetite to increase. Decreased cortisol can lead to fatigue, which can increase food intake in an effort to restore energy. As excessive appetite is often present in hyperthyroid patients, and thyroid function controls metabolism, dysfunction of the thyroid gland can result in changes in appetite; therefore, consider assessing thyroid hormone levels.

Patient checked FATIGUE/DECREASED STAMINA on the questionnaire. Chronic fatigue can be caused by numerous conditions, the most common of which are 1) inadequate sleep (consider sleep pathologies), 2) low or high blood sugar, 3) hypothyroidism, and 4) adrenal fatigue, usually demonstrated by inadequate cortisol, particularly low morning levels (87% of patients indicating fatigue of moderate or severe intensity measure low a.m. cortisol). Consider assessing adrenal hormone levels as cortisol plays a major role in the promotion of energy. Low stores of excitatory neurotransmitters, such as norepinephrine, epinephrine, and glutamate, can also influence energy levels. Other reasons for fatigue involve inadequate dietary protein or B vitamins, dysregulation of mitochondrial function, anemia, depression, acute or chronic illnesses, heavy metal toxicity as well as acute and chronic environmental toxins, and certainly many medications. Assessment of thyroid, iron status, blood sugar, diet and adrenal function are all warranted. Of the patient population who indicated moderate to severe focus problems, 71% demonstrate low or low-normal dopamine.

When POOR FOCUS is a symptom, use concurrent inhibitory support (to prevent over-excitation) with catecholamine pathway support to rebuild dopamine to restore focus and directed attention. Poor focus and memory issues can also be related to

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chronic stress and adrenal dysfunction. Decreased thyroid function is known to impede cognitive function; therefore, consider assessing thyroid hormone levels.

Patient indicated POOR MEMORY. Memory is dependent upon balance among many central neurotransmitters. Adequate glutamate is required for learning and memory; 60% of patients marking moderate or severe memory issues have low/low normal glutamate. Adequate dopamine is also necessary; low levels can impair working memory, in particular. 70% have low or low-normal dopamine. Norepinephrine is also required-both short-term memory and long-term memory depend on adequate NE levels. Acetylcholine is a primary neurotransmitter for the laying down of memory traces and, though not measured, can be supported by increasing dietary choline or supplementing with phosphatidylcholine or DMAE. Serotonin is also required for proper memory (acute tryptophan depletion can directly impair memory). There is evidence in the literature, however, that extreme excesses of norepinephrine, glutamate and serotonin can also impair memory. Additionally, chronic elevations of cortisol damage the hippocampus, the center for short-term memory, and DHEA should be repleted when low, since it is known to be neuroprotective to the hippocampus; consider assessing adrenal hormone levels. Balance, then, among the neurochemicals, is of utmost importance for establishment and maintenance of memory. Decreased thyroid function is known to impede cognitive function; therefore, consider assessing thyroid hormone levels.

Patient indicated DEPRESSION as a concern. There are multiple pathways in the central nervous system where imbalance can produce depressive symptoms, the most well-known of which are the bioamine (serotonin, norepinephrine, dopamine) pathways. Low serotonin levels are often associated with depression, particularly depression with concurrent anxiety, dread, and insomnia. If patient shows normal or high serotonin, consider that serotonergic or overall inhibitory function is not adequate; inhibitory support may be beneficial despite the normal urinary levels. High urinary levels of serotonin may be indicative of high loss, which may be due to receptor blockage (medication or heavy metal toxicity), 5-HTP supplementation or high neurotransmitter turnover. Depression can also be associated with low dopamine and/or norepinephrine, especially those with vegetative depressions that involve lack of adequate drive, ambition, focus or energy and typically present with lethargy, fatigue, excess sleep and lowered HPA function. If the patient has normal or high urinary bioamine levels, indicating high loss, function may still be low. High loss may be due to receptor blockage (medication or heavy metal toxicity), supplementation or high neurotransmitter turnover. Depression can also be associated with low blood RBC, low serum ferritin levels, and low levels of the essential fatty acid EPA. Bioamine repletion (if necessary) and EPA supplementation (e.g., fish oil) may be warranted with the addition of co-factors required for the pathways, such as B6 as P5P. Optimal thyroid function is paramount to comprehensive treatment of depression. As medical research is replete with references regarding mood and thyroid function, consider adding a comprehensive thyroid assessment. As elevated cortisol and low DHEA levels have a known association with presence of depression; consider assessing adrenal hormone levels.



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Summary/Recommendations

Patient is in: Initial Phase

The following therapeutic protocol is based on conclusions derived from patient lab results, clinical data, gender, age, etc, and symptoms listed on the patient questionnaire. The goal of this protocol is to help the doctor begin the three-phase process of restoring balance in the HPA-T axis, while also improving symptoms for patient optimum well-being. The Initial Phase is the beginning of the patients rebuilding process, where TNT is introduced to help move lab values in the right direction. Leaving the patient on the Initial protocol longer than necessary may unbalance the patient. Retesting initiates the Restoration Phase. It provides significant two-fold value in that it serves as a guide in adjusting or fine-tuning the therapy. In addition, it allows for monitoring of progress as the patient rebalances their signaling biochemicals on the path toward optimum well-being.

OVERALL SUMMARY and RECOMMENDATIONS:

- Lentra** x 1 capsule daily for GABA support; may increase to twice daily
Contains: GABA-A agonists: Magnesium Taurate, Suntheanine, and Lactium
- Tranquilent** x 1-2 chewable tablets as needed for anxiety
Contains: low doses of 5HTP and suntheanine, with Myo-Inositol
- Procite-D** After 14 - 21 days, once anxiety improves, may add x 1 in the AM
for dopamine support
Contains: Mucuna pruriens, N-acetyl-L-tyrosine, DL-phenylalanine, NAC
and B vitamins.

The above supplementation range is available to practitioners through Nutrisearch NZ.
Australian Freephone: 1800 177 959
New Zealand Freephone: 0800 88 44 33
Email: info@nutrisearch.co.nz

Retesting is an important part of this process. NT levels need to be monitored.
Retesting for this patient is recommended in 6 weeks.

Additional Recommendations

* It is recommended that all patients on a program to balance HPA axis function should also supplement with B complex, a multi-mineral and multi-vitamin as well as EPA/DHA.

Disclaimers

- * These products are not intended to diagnose, treat, cure, or prevent any disease.
- *The statements above are recommendations to the clinician. All final therapeutic decisions are the responsibility of the treating physician.
- * Please call Nutripath on 1300 688 522 with your technical and clinical questions. For further reading and references, please refer to Nutripath's Technical guide and Clinical guide.



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Neuroendocrine Comments

CORTISOL

To downregulate Cortisol (If Cortisol is High): Phosphatidyl Serine, DHEA, Choline, Inositol, Adaptogenic Herbs e.g. Siberian Ginseng, Withania, Vit C, Magnesium, Vit B

To upregulate Cortisol (If Cortisol is low): Adaptogens e.g. Ginseng, Withania, assess and balance hormone imbalance, insulin sensitivity, hydrocortisone, DHEA, Magnesium, Vit B, Assess and correct hormonal balance, insulin sensitivity

DHEA

DHEA, Adaptogen e.g. Siberian Ginseng, Withania, and adrenal support e.g. ginseng, Activated B3

Methyl Cofactors

Vit B6, Activated B6, SAME, Methionine, Folinic Acid, TMG, DMG

Melatonin

Melatonin, passionflower, Hops, Adenosine, Kava

Based on your test results, your practitioner will advise upon natural supplementation of specific formulary.

SEROTONIN (Inhibitory Neurotransmitter) LEVELS WITHIN RANGE:

Serotonin levels may be within range, however, if the patient is exhibiting symptoms you may wish to consider that the reported reference range is not optimal for this patient. Optimal Serotonin levels are levels at which serotonin can effectively counterbalance elevated excitatory neurotransmitters (esp Dopamine and Norepinephrine). Even if Serotonin is above the observed reference range but is not proportional to (or able to control) elevations in the catecholamines, then more Serotonin support is needed.

GABA (Inhibitory Neurotransmitter) LEVELS LOW:

GABA levels may be low due to the following: Vitamin B6 deficiency, Chronic anaemia, Chronic alcohol use.

Recommendations: Kava Kava, Zizyphus, Magnolia, Passionflower, Lemon Balm, Glutamine, Taurine, Zinc, B6, GABA, Magnesium taurate, L-theanine, Lactium

Creatinine, Urine Spot.

7.8 *L 8.0 - 19.0

mmol/L



Tests ordered: ENEUM

(*) Result outside normal reference range

(L) Result is below lower limit of reference range