

(Hypothalamic-Pituitary-Adrenal Axis)

**Anita Doc** 

ID#: 301789 Gender: F Age: 58 Will Fiksu, MD 123 Serotonin Pathway Sanesco, NC 00001 Date Reported 10/22/2015

Date Collected 10/12/2015

**Date Received** 10/15/2015

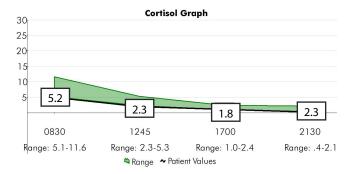
**Lab Final** 10/18/2015

Report Final 10/22/2015

Marker	Value	es	Previo	us Value	Optimal Range	Reference Range
	IN	HIBITOR	Y NEURO	TRANSMI	TTERS	
SEROTONIN	192.0		42.5	(L)	125 - 260 mcg/g Cr	50-250 mcg/g Cr
GABA	306.3 (	(L)	137.2	(L)	600-1100 mcg/g Cr	150-700 mcg/g Cr
	EX	CITATOR	RY NEURO	DTRANSMI	ITTERS	
DOPAMINE	133.6 (	(L)	104.7	(L)	250-400 mcg/g Cr	100-350 mcg/g Cr
NOR-EPINEPHRINE	35.1		27.0	(L)	30-50 mcg/g Cr	13-70 mcg/g Cr
EPINEPHRINE	7.1 (	(L)	4.1	(L)	10-15 mcg/g Cr	3-20 mcg/g Cr
GLUTAMATE	8.9		20.3	(H)	5-10 mg/g Cr	2-12 mcg/g Cr
		ADRENA	L ADAPT	ATION IN	DEX	
NOREPI/EPI RATIO	4.9		6.6		N/A	<13
		ADRE	NAL HO	RMONES		
CORTISOL (0830)	5.2		4.9	(L)	N/A	5.1-11.6 nM
CORTISOL (1245)	2.3		2.0	(L)	N/A	2.3-5.3 nM
CORTISOL (1700)	1.8		1.1		N/A	1.0-2.4 nM
CORTISOL (2130)	2.3 (	(H)	4.3	(H)	N/A	.4-2.1 nM
DHEA-s (0830)	1.9		1.2		N/A	1.0-3.0 ng/ml
DHEA-s (1700)	1.8		1.4		N/A	1.0-3.0 ng/ml
		0	THER MA	RKERS		
CREATININE, URINE	178.1		100.0		N/A	mg/dL

Creatinine is used to calculate results and is not intended to be used diagnostically.

(L) & (H) are based on optimal ranges.



Performance specifications for the test were established by the testing laboratory, test methodology has not been cleared or approved by the FDA. All equipment and testing materials are maintained according to manufacturer provided inserts and instructions. Whenever laboratory data conflicts with clinical findings and impressions, clinical judgement should be excercised and additional evaluation undertaken.



CORRELATION ANALYSIS REPORT

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### The CSM™ And Your Patient

The object of the Communication System Management™ (CSM) Model is to help restore balance to the HPA axis. One of the cornerstones of the CSM model is to monitor neurotransmitter and adrenal hormone levels by retesting the patient throughout the rebalancing process. This is the most effective way to quide individual therapy. The patient's current laboratory values can be measured against previous results, allowing for imbalances to be more adequately addressed. Targeted Nutritional Therapy™ can be adjusted as results are compared. With each retest, the aim is to move the patient closer to achieving HPA axis balance and an improved sense of well-being.

Since the patient's last test, the patient has seen all symptoms (anxiety, decrease stamina, fatigue, depression with exhaustion, insomnia, and poor sleep) decrease in severity. However, the patient is still experiencing these symptoms. Serotonin has risen and is now within its optimal range, while GABA remains suboptimal. The patient's anxiety, insomnia, and poor sleep may be related to the suboptimal level of GABA. The inhibitory neurotransmitters serotonin and GABA function together to promote calm, relaxation, and a sense of well-being. Therefore, consider continuing with supplemental support for GABA and slightly decreasing supplemental support for serotonin to help restore optimal inhibitory neurotransmitter balance and potentially assist in further improving the patient's anxiety and sleep concerns. Additionally, consider implementing a sleep support supplement that contains time-release melatonin to aid in restfulness while the patient's inhibitory neurotransmitter balance continues to be restored.

The patient's dopamine, norepinephrine, and epinephrine levels have all risen. Dopamine and epinephrine remain suboptimal, while norepinephrine is now optimal. Glutamate has lowered and is now within its optimal range. The patient's depression with exhaustion, decreased stamina, and fatigue may be related to the suboptimal levels of dopamine and epinephrine. Dopamine can have an influence on happiness and positive emotions as it functions to create a sense of pleasure and reward in the brain, while epinephrine can play roles in energy level maintenance. Therefore, consider increasing supplemental support for the catecholamines to help continue to restore dopamine and epinephrine levels. The patient's cortisol levels are showing improvement since the last test. However, the morning cortisol level is low-normal, and the patient has continued complaints of decreased stamina and fatigue. Therefore, consider continuing with the patient's current supplemental adrenal support. Retesting is recommended in 12 weeks to assess the restoration process and make any necessary adjustments to the suggested therapeutic protocol.

Marker	Values	Previous Value	Reference Range
	ADR	ENAL HORMONES	
CORTISOL (0830)	5.2	4.9 (L)	5.1-11.6 nM
CORTISOL (1245)	2.3	2.0 (L)	2.3-5.3 nM
CORTISOL (1700)	1.8	1.1	1.0-2.4 nM
CORTISOL (2130)	2.3 (H)	4.3 (H)	.4-2.1 nM
DHEA-s (0830)	1.9	1.2	1.0-3.0 ng/ml
DHEA-s (1700)	1.8	1.4	1.0-3.0 ng/ml

### **Adrenal Comments**

This patient has a normal morning cortisol level, with one or more of the other three readings above reference range. Adrenal function is sufficient for the normal morning cortisol rise. Cortisol surges throughout the day may result from stress, high glycemic meals which may result in reactive hypoglycemia causing elevated cortisol to support the low blood sugar. Excess caffeine or nicotine, adrenal glandulars, supplemental or prescriptive cortisone products, pain and/or viral infections can also cause elevated levels of cortisol.



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Nearly half of insulin resistant patients demonstrate elevated evening cortisol. An elevated evening cortisol level can sometimes contribute to poor sleep and increased sleep latency, i.e. difficulty falling asleep.

Normal DHEA suggests this patient is in the "adaptive phase" of Selye's "General Adaptation Syndrome", however, if the patient is under chronic stressors, overtime, hormone production will be shunted to cortisol at the expense of DHEA and low DHEA levels will result (maladaptive phase). During a sustained stress response, which requires continual cortisol secretion, the organism will begin to adapt - that is, begin to feel that the elevated levels of cortisol and catecholamines are "normal." As time goes on, and if the stressors continue, the adrenals will start to lose their ability to compensate (maladaptive phase) and testing will usually show increased cortisol and decreased DHEA.

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). 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, and diet are all warranted.

\*The following are additional recommendations to assist in recovery from or to prevent adrenal fatigue: Adequate nutrient intake including multivitamin/multimineral, B-vitamin (Pantothenic Acid), Vitamin C, Magnesium, and Omega 3 Fatty Acids. Consider hormone support if necessary for DHEA, Pregnenalone, Progesterone, as well as adrenal support. Supportive lifestyle factors include structuring proper sleep hygiene with 8-10 hours per night; avoid stimulants and limit coffee, soda, nicotine, and caffeine; eat a balanced diet of small meals interspersed throughout the day and include lean protein, unprocessed carbohydrates, and healthy fats; increase water consumption to at least 64 oz per day; gentle exercise; make time for quietude.

#### **Neurotransmitter Comments**

Marker	Values	Previous Value	Optimal Range	Reference Range
	INHIBITOR	Y NEUROTRANSMI	TTERS	
SEROTONIN	192.0	42.5 (L)	125 - 260 mcg/g Cr	50-250 mcg/g Cr
GABA	306.3 (L)	137.2 (L)	600-1100 mcg/g Cr	150-700 mcg/g Cr

### **Inhibitory Neurotransmitters**

Patient indicated ANXIETY, which is often the result of decreased inhibitory neurotransmission and/or excess excitatory neurotransmission. However, this patient has a normal serotonin level. As mood concerns were noted with normal urinary levels of serotonin, consider that overall inhibitory function may be suboptimal, possibly due to suboptimal glycine and/or GABA 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. Elevated adrenal hormone levels are known to contribute to the presence of anxiety concerns. If adrenal hormone levels are elevated, consider identifying and appropriately managing stressors, dietary components and/or medication, which may be contributing to up-regulated adrenal function and the presence of mood concerns. When up-regulated, thyroid hormones may also generate feelings of anxiety for the patient; therefore, consider a comprehensive thyroid hormone assessment.



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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.

The patient has indicated problems with SLEEP. Although serotonin is within normal range, serotonin function may not be optimal to support proper sleep. 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. 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. Individuals with thyrotoxicosis often present hypermetabolic features; therefore, abnormalities in sleep regulation may also be associated with thyroid dysfunction.

	E	XCITATO	RY NEUR	OTRANSM	ITTERS	
DOPAMINE	133.6	(L)	104.7	(L)	250-400 mcg/g Cr	100-350 mcg/g Cr
NOR-EPINEPHRINE	35.1		27.0	(L)	30-50 mcg/g Cr	13-70 mcg/g Cr
EPINEPHRINE	7.1	(L)	4.1	(L)	10-15 mcg/g Cr	3-20 mcg/g Cr
GLUTAMATE	8.9		20.3	(H)	5-10 mg/g Cr	2-12 mcg/g Cr
		ADRENA	L ADAPT	ATION IN	DEX	
NOREPI/EPI RATIO	4.9		6.6		N/A	<13

### **Excitatory Neurotransmitters**

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 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. Medical research is replete with references regarding mood and thyroid function; consider adding a comprehensive thyroid assessment. Additionally, depression is associated in the literature with elevations in cortisol, particularly evening elevations. It is well known that Cortisol Releasing Factor (CRF) is increased in healthy patients with depression, which lead to increased cortisol levels. The medical literature also supports the fact that unmedicated unipolar and bipolar depressed patients have a 'hyperresponsive' noradrenergic system (with elevated NE levels and turnover). This is a common pattern along with low serotonin levels. In addition, much research suggests that both hypothalamic and extrahypothalamic CRF activates the locus ceruleus in the brain, leading to an increase in norepinephrine. Thus, high CRF activity might lead to both elevated cortisol and norepinephrine levels seen in depressed patients. In cases of low DHEA, supplemental DHEA administration is warranted, as supplemental DHEA has been associated with improvement in symptoms of depression.



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THERAPEUTIC RECOMMENDATIONS

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### Patient is in: Restoration Phase

The following therapeutic protocol is based on previous and current patient lab results, clinical data such as gender, age, etc., and previous and current patient complaints based on patient self-assessment questionnaire. The goal of the Restoration Phase is to return the patient to optimal levels of neurotransmitters and adrenal hormones as well as physical and emotional balance. Depending upon how the patient responded to previous therapeutic protocols, the next stage will reflect decisions to optimize the rebalancing process. Continuing the path towards balancing the HPA-T axis and improving patient outcomes is the main goal. Retesting will be important, and it may be necessary to retest more than a few times until optimum balance is achieved. When the practitioner and patient agree that they have found an improved level of balance, the Maintenance Phase will begin.

### **Overall Summary and Recommendations**

Prolent™	Decrease to x 1 in the PM.	
	Contains 5HTP, Suntheanine, glycine, and B6	
Lentra™	Continue with x 1 twice daily for GABA support	
	Contains GABA-A agonists: magnesium taurate, Suntheanine, and Lactium	
Adaptacin™	Continue with x 2 in the AM for adrenal support.	
	*Do not take after 2PM as it may disrupt sleep	
	Contains Bovine Adrenal Cortex, adaptogens, and vitamin cofactors	
Procite-D™	Increase to x 1 in the AM for catecholamine support.	
	Contains: Mucuna pruriens, N-acetyl-L-tyrosine, DL-phenylalanine, NAC and B vitamins	
SomniTR™	Implement x 1 before bed to improve the quality of sleep.	
	Please allow 8 hours for sleep when using SomniTR	
	Contains delayed-release melatonin, Lactium, and Coleus forskohlii	

Retesting is an important part of this process. NT levels need to be monitored. Retesting for this patient is recommended in 12 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 statements have not been evaluated by the Food and Drug Administration. These products are not intended 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 Sanesco International at 866-670-5705 with your technical and clinical questions. For further reading and references, please refer to Sanesco's Technical guide and Clinical guide.

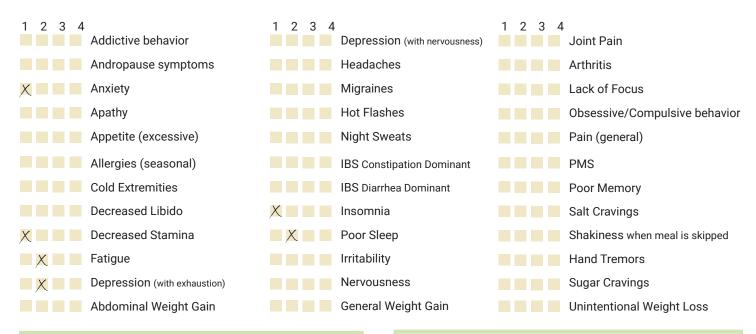


## Patient Questionnaire

First Name  Middle Initial Last Name  Awita  A Doc  Gender Male X Female  Weight (Ib) 139 Height (ft,in) 5 5 Doctor's Name Dr. Firsu md  State TX  Preferred Phone (xxx-xxx-xxxx)  Email  866-670-5705  Awita@sawesco.wet  Lifestyle Factors  Caffeine: # of cups/bottles per da 1 Alcohol: # of drinks 2 days before te: 1 X Smoke Exercise Regularly  Vegetarian Vegan X Stressful Lifestyle Regular use of soda or energy drinks Irregular sleep schedule  Medical Diagnosis
Weight (Ib) 139 Height (ft,in) 5 5 Doctor's Name Dr. Firsumd State TX  Preferred Phone (xxx-xxx-xxxx) Email  866-670-5705 Awita@sawesco.net  Lifestyle Factors  Caffeine: # of cups/bottles per da 1 Alcohol: # of drinks 2 days before te: 1 X Smoke Exercise Regularly  Vegetarian Vegan X Stressful Lifestyle Regular use of soda or energy drinks Irregular sleep schedule  Medical Diagnosis
Weight (lb) 139 Height (ft,in) 5 5 Doctor's Name DY. FIRSU Md State TX  Preferred Phone (xxx-xxx-xxxx) Email  866-670-5705 Anita@sanesco.net  Lifestyle Factors  Caffeine: # of cups/bottles per da 1 Alcohol: # of drinks 2 days before te: 1 X Smoke Exercise Regularly  Vegetarian Vegan X Stressful Lifestyle Regular use of soda or energy drinks Irregular sleep schedule  Medical Diagnosis
Preferred Phone (xxx-xxx-xxxx)  Email  866-670-5705  Aunita@sanesco.net  Lifestyle Factors  Caffeine: # of cups/bottles per da 1 Alcohol: # of drinks 2 days before te: 1 X Smoke Exercise Regularly  Vegetarian Vegan X Stressful Lifestyle Regular use of soda or energy drinks Irregular sleep schedule  Medical Diagnosis
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ADD/ADHD Autism Bipolar Anorexia Bulimia Psychosis Elevated Homocysteine Pregnant or Blood Pressure Celiac  Low X High  Medications   Indicate the number of months on the medication
ADD/ADHD Meds. Anti-Inflammatory Cancer Treatment Parkinson's Meds
Adrenal Glandular Anti-Psychotic Meds Diabetes Meds Sleep Meds
Allergy Meds 100 + Birth Control Pills Hormones Seizure Meds
Anti-anxiety Meds Blood Pressure Meds 33 MAO Inhibitors Thyroid Meds 11
Anti-depressant Cardiac Meds Pain Meds Kidney Meds
Nutritional Supplements & Herbs
Contegra™ X Prolent™ GABA St. Johns Wort 5HTP  IMPORTANT Completely fill out your sample collection times below  Urine Collection  Date  10/12  Date  10/12  Time  Contegra™ X Prolent™ GABA St. Johns Wort 5HTP  X Lentra™ SomniTR™ Glutamine Theanine Kava Kava  MethylMax™ Tranquilent™ Melatonin Trytophan Pass. Flower Magnesium Phosphatidylserine Tyrosine Magnesium SAMe Phenylalanine X Probiotics  Urine Collection  1st saliva  2nd saliva  3rd saliva  4th saliva  Time  10/12  Date  10/12  Time  12:45  Time  17:00  Time  21:30

### Please check symptoms below based on the severity they cause you currently

1 - (mild) 2 - (moderate) 3 - (severe) 4 - (profound) - choose no more than 10 symptoms



List the name, dosage, and frequency of the medications checked on the front side

Levoxl 75mcg daily Lisinopril 20mg daily Zyrtec 10mg daily List the name, dosage, and frequency of the supplements and/or herbs checked on the front side

Prolent x 2 daily

Lentra x 1 twice daily

Adaptacín x 2 in the AM Procite-D x 1 in the AM

(every other day)

Additional Comments and Other Important Clinical Information

### **Privacy Statement**

"I certify that the information provided in this questionnaire is accurate to the best of my knowledge. I understand that the information contained in this questionnaire may be used for the processing and release of your healthcare services to your provider as detailed in the enclosed notice of privacy practices of Sanesco International Inc. My signature indicates that I have received, reviewed, and understand the above information."

Signature Aníta Doc

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