Test Results:
Neuro-Hormone Report

Report Number:
-S0100

Provider:
Sample Reports
16255 SE 130th Ave
Clackamas, OR 97230
Ordering Provider: Labrix LLC

Patient Info:
Joe S Sample

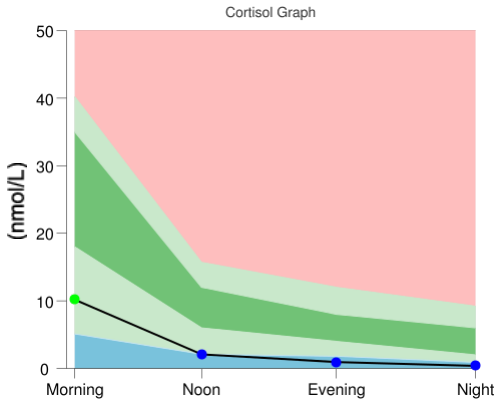
Age:46 **Gender:**M

Menopausal Status:

,

Sample Collection	Date/Time
Morning	09/21/2016 0630
Noon	09/21/2016 1130
Evening	09/21/2016 1700
Night	09/21/2016 2200
Urine	09/21/2016 0730
Wake Up Time	0545
Samples Arrived	09/23/2016
Results Reported	09/26/2016

	Saliva Hormone Test	Result	Units	L	WR	H	Reference Range
HORMONES	**Estrone (E1)**		pg/ml				
	Estradiol (E2)	< 1.00	pg/ml		◆		**<2.5 male**
	Estriol (E3)		pg/ml				
	EQ (E3 / (E1 + E2))						
	Progesterone (Pg)	12.16	pg/ml		◆		**<94.0 male (500-3000 supplementation)**
	Ratio of Pg/E2	12.16		↓			**200-300 male (Pg supplementation)***
	Testosterone	37.10	pg/ml		◆		**30.1-142.5 male (142.6-350.0 supplementation)**
ADRENALS	**DHEA**	< 10.24	pg/ml	↓			**137.0-336.0 male**
	Cortisol Morning	10.17	nmol/L		◆		**5.1-40.2; optimal range: 18-35***
	Cortisol Noon	2.08	nmol/L	↓			
	Cortisol Evening	0.94	nmol/L	↓			**1.8-12; optimal range: 4-8***
	Cortisol Night	0.38	nmol/L	↓			**0.9-9.2; optimal range: 2-6***



Adrenal Phase: 2

Hormone Comments:

- The low Pg/E2 ratio is consistent with progesterone insufficiency (estrogen dominance), which may increase the risk of prostate gland enlargement and cancer. Supplementation with topical progesterone to correct this relative deficiency is a consideration.
- Low range testosterone is consistent with reported deficiency symptoms and may be associated with metabolic syndrome (insulin resistance). Fasting blood sugar and insulin levels may be warranted. Boosting the testosterone level is a consideration.
- While DHEA levels are expected to decline with age (adrenopause), the DHEA level measured here is below the age related decline. The low DHEA level may warrant supplementation for optimal well-being. Note: Supplementation with DHEA may increase testosterone and/or estradiol levels.
- Diurnal cortisol pattern and reported symptoms are consistent with evolving (Phase 2) HPA axis (adrenal gland) dysfunction, although concomitant thyroid and/or iodine insufficiency cannot be ruled out.

Notes:

L=Low(below range) WR=Within Range (within range) H=High (above range)
DHEA, DHT, Testosterone, Estrone and Estriol results are for investigational use only.
*Apply only when all four cortisols are measured. Clinical comments may override these generalized optimal ref. ranges.
**The Pg/E2 ratio is an optimal range established based on clinical observation. Progesterone supplementation is generally required to achieve this level in men and postmenopausal women.

Jay H. Mead MD FASCP
Labrix Clinical Services, Inc Medical Director

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NEUROTRANSMITTERS

Neurotransmitter Test	Result	Units	L / WR / H	Reference Range	
Serotonin	65.10	µg/gCr		**74.13 - 111.19**	INHIBITORY
GABA	2.25	µMol/gCr		**2.76 - 4.14**	
Dopamine	140.83	µg/gCr		**139.1 - 208.7**	
Norepinephrine	21.27	µg/gCr		**28.07 - 42.11**	
Epinephrine	3.49	µg/gCr		**3.36 - 5.05**	EXCITATORY
Glutamate	80.56	µMol/gCr		**21.89 - 70.51**	
N/E Ratio	6.10			**<10.0**	
Creatinine	101.54	mg/dL			
Specific Gravity	1.013				

Neurotransmitter Comments:

- Amended report 10/05/2016: 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. Alterations in urinary neurotransmitter balance may be associated with many clinical symptoms including cognitive and mood concerns, diminished drive, fatigue and sleep difficulties, cravings, addictions and pain.
- Low serotonin may contribute to mood concerns including anxiety, depression and a sense of discontentment. Diminished serotonin may also be implicated in poor sleep quality and appetite changes as well as muscle and body aches and over-all lassitude. Tryptophan, L-theanine and 5-HTP influence this pathway.
- Low GABA may be associated with anxiety, poor impulse control, depression, pain, and decreased sleep quality. Low GABA may be seen in individuals deficient in vitamin B6. L-theanine, GABA, and glutamine influence this pathway, while phenibut exerts GABA-like effects.
- Low range dopamine may be associated with anxiety/depression, difficulty concentrating, decreased libido and obesity and may be associated with increased addiction, repetitive behaviors and other stimulation seeking activities. Production of dopamine requires vitamin D, tetrahydrobiopterin, iron and vitamin B6. L-tyrosine, L-theanine and Mucuna pruriens influence this pathway.
- Low norepinephrine and low range 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 glutamate may contribute to anxiety, poor concentration, attention deficits and hyperactive tendencies as well as poor sleep and nighttime awakening. Possible sources of increased glutamate include MSG, yeast extract and other hidden sources of free glutamic acid. L-theanine may modulate elevated glutamate levels where taurine may provide protection from excitotoxicity.
- Considerations to address the demonstrated imbalances include targeted amino acid support and dosage adjustments if indicated, as well as nervine and adaptogenic herbs, co-factor repletion, methylation support, vitamin D and L-theanine. 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.

Notes:

**Creatinine has no diagnostic value and is measured solely for calculation of neurotransmitter levels.*
**Neurotransmitter test results are for investigational use only.*

Jay H. Mead MD FASCP
Labrix Clinical Services, Inc Medical Director

Test Results:
Melatonin Report

Report Number:
-S0100

Provider:
Sample Reports
16255 SE 130th Ave
Clackamas, OR 97230
Ordering Provider: Labrix LLC

Patient Info:
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Age:46 **Gender:**M

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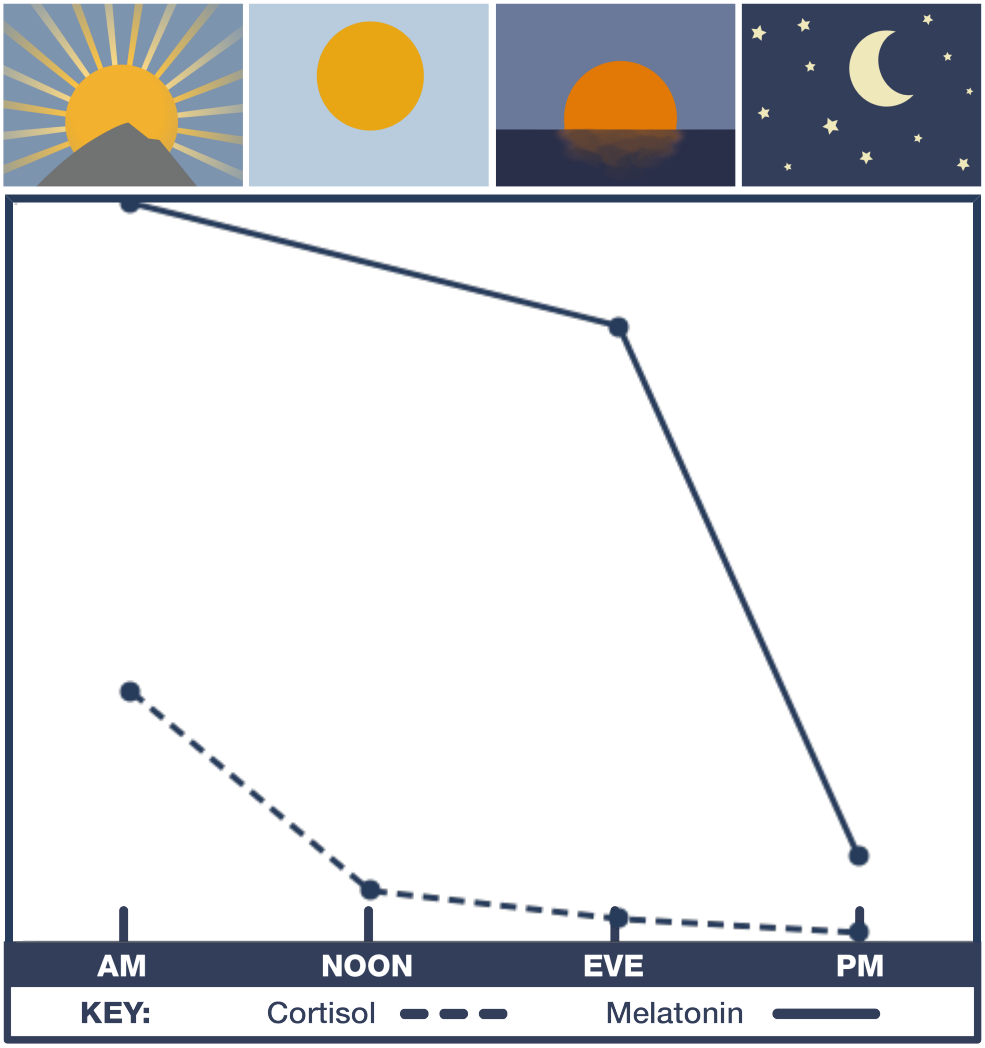
Melatonin Test	Result	Units	Reference Range
Melatonin Morning	30.25	pg/ml	**2.98 - 24.90**
Melatonin Evening	25.00	pg/ml	**1.37 - 19.30**
Melatonin Night	3.50	pg/ml	**4.27 - 25.29**



Melatonin Comments:

Melatonin levels follow a diurnal rhythm in response to the light-dark cycle, with highest levels produced at night during times of darkness. Melatonin and cortisol levels have an inverse relationship. Whereas optimal cortisol levels are highest 30 minutes after waking with a gradual decline throughout the waking day and continued decline to lower nighttime levels, melatonin levels are lower during the daytime and gradually rise later in the evening when light is dim, beginning approximately 2 hours before bed time. Disruptions in expected melatonin and/or cortisol pattern(s) may result in sleep disturbances and insomnia.

Notes:

* Melatonin test results are for investigational use only.
* Graphs and illustration are for diurnal comparison only.

Jay H. Mead MD FASCP
Labrix Clinical Services, Inc Medical Director

Melatonin

Melatonin is a hormone that also acts as a neurotransmitter. It is the major indole compound synthesized by the pineal gland and is converted from serotonin. Melatonin levels follow a diurnal rhythm in response to the light/dark cycle (melatonin and light occur at opposite times). Endogenous melatonin production begins approximately 2 hours before bedtime, provided light is dim.

Many people are familiar with melatonin because of its influence on sleep. Healthy melatonin curves help positively influence the initiation and maintenance of quality sleep cycles, and disruptions in melatonin curves, commonly referred to as phase shifts, may present clinically as disordered sleep patterns.

Melatonin seems to be particularly helpful in dealing with sleep onset latency - the length of time it takes to transition from full wakefulness to sleep. Thus, it may be an effective treatment for those patients who report difficulty *falling* asleep. Extended release forms of melatonin may prove helpful in patients who have difficulty *staying* asleep.

Although it's most well-known for its association with sleep, melatonin holds many other clinically relevant roles. Melatonin is a potent antioxidant found in almost every cell in the body! It stimulates immune function and decreased levels are frequently noted in cancer patients as well as individuals with impaired CNS function. Melatonin may aid in weight loss and mood support, and has been shown to exhibit anti-aging potential. In addition, melatonin's antioxidant activity may be protective to the ovum at ovulation, optimizing progesterone secretion, and has even demonstrated positive effects in the success rate of in vitro fertilization.

Melatonin and cortisol share an inverse relationship – when melatonin levels are low, cortisol levels should be high and vice versa. However, just as it is possible to see disruptions in cortisol curves, disruptions in melatonin curves may be noted and are influenced by several factors. For instance, declines in melatonin levels are seen with age, blue light exposure (as commonly emitted by TV and computer screens), and some medications including benzodiazepines and antihypertensives (beta blockers). Some antidepressants and anti-psychotics may shift melatonin curves, as can strenuous exercise. Melatonin supplementation can be particularly useful for people who engage in shift work or are jet lagged.

Treatment considerations to optimize melatonin levels:

- Keep a regular schedule
- Increase amount of light exposure during daytime hours
- Decrease amount of light exposure (especially blue light) during evening hours
- Melatonin supplementation

Supplementation

Immediate release melatonin may be beneficial for those individuals with difficulty falling asleep and lower night time melatonin levels. Extended release forms are also available, and these typically release melatonin gradually over 5-8 hours and may be more beneficial for those with night-time wakefulness. Thus, it is generally recommended to take melatonin 30-60 minutes before bedtime, with sublingual, liquid and chewable forms likely having an effect more quickly than capsules, and extended release formulations affecting melatonin levels longer than immediate release formulations.

Taking melatonin is not associated with suppression of the body's own ability to produce melatonin. Even at doses as high as 50 mg, melatonin has not demonstrated addictive qualities or suppression of endogenous production.

References

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- Taniguchi K, et al. Melatonin Protects Granulosa Cells for Progesterone Production as an Antioxidant in Human Ovarian Follicles. *Biology of Reproduction*. March 2009.
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