TEST REPORT

8605 SW Creekside Place
Beaverton, OR 97008
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ZRT LABORATORY

 # 2018 08 06 200 U

Ordering Provider:
John Doe, ND

Samples Received
08/06/2018

Report Date
08/10/2018

Samples Collected
Urine - 07/30/18 07:40
Urine - 07/30/18 10:05
Urine - 07/30/18 16:20
Urine - 07/30/18 23:00

Patient Name: Sleep Balance
Patient Phone Number: 555 555 5555

Gender	Last Menses	Height	Waist
Female	06/01/2018	5 ft 6 in	25 in
DOB	**Menses Status**	**Weight**	**BMI**
12/14/1974 (43 yrs)	Pre-Menopausal	115 lb	18.6

TEST NAME	RESULTS | 07/30/18	RANGE
Urinary Free Diurnal Cortisol		
Free Cortisol	15.15	7.8-29.5 µg/g Cr (1st Morning)
Free Cortisol	153.58 H	23.4-68.9 µg/g Cr (2nd Morning)
Free Cortisol	47.72 H	6.0-19.2 µg/g Cr (Evening)
Free Cortisol	16.06 H	2.6-8.4 µg/g Cr (Night)
Urinary Free Diurnal Cortisone		
Free Cortisone	39.48	31.6-91.6 µg/g Cr (1st Morning)
Free Cortisone	265.11 H	63.3-175.8 µg/g Cr (2nd Morning)
Free Cortisone	111.63 H	30.6-88.5 µg/g Cr (Evening)
Free Cortisone	55.61 H	15.5-44.7 µg/g Cr (Night)
Urinary Diurnal Melatonin MT6s		
Melatonin	14.72 L	18.0 - 40.9 µg/g Cr (1st Morning)
Melatonin	11.09	7.3 - 31.9 µg/g Cr (2nd Morning)
Melatonin	2.38 H	0.7 - 2.2 µg/g Cr (Evening)
Melatonin	1.63 L	1.7 - 11.1 µg/g Cr (Night)
Urinary Creatinine		
Creatinine	1.15	0.3-2.0 mg/mL (1st morning)
Creatinine	0.71	0.3-2.0 mg/mL (2nd morning)
Creatinine	0.94	0.3-2.0 mg/mL (Evening)
Creatinine	0.45	0.3-2.0 mg/mL (Night)

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The above results and comments are for informational purposes only and are not to be construed as medical advice. Please consult your healthcare practitioner for diagnosis and treatment.

David T. Zava, Ph.D.
Laboratory Director

Alison McAllister, ND.
(Ordering Provider unless otherwise specified on page 1)

TEST NAME	RESULTS | 07/30/18	RANGE

<dL = Less than the detectable limit of the lab. N/A = Not applicable; 1 or more values used in this calculation is less than the detectable limit. H = High. L = Low.

Therapies

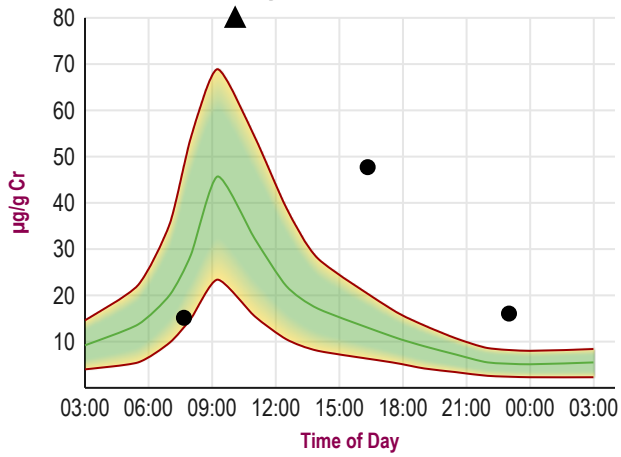
oral Seasonique -BC (Pharmaceutical) (1 Days Last Used)

Graphs

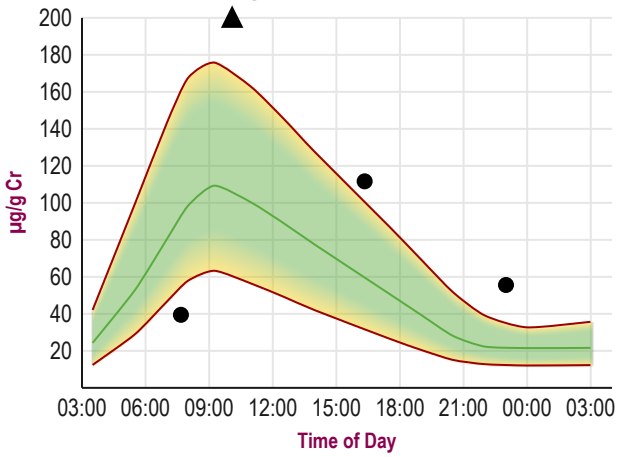
Disclaimer: Graphs below represent testers not using hormones; results may not plot for supplementation. Graphs are provided for informational purposes only. Please see lab comments if results are higher or lower than expected.

Average ▼▲ Off Graph

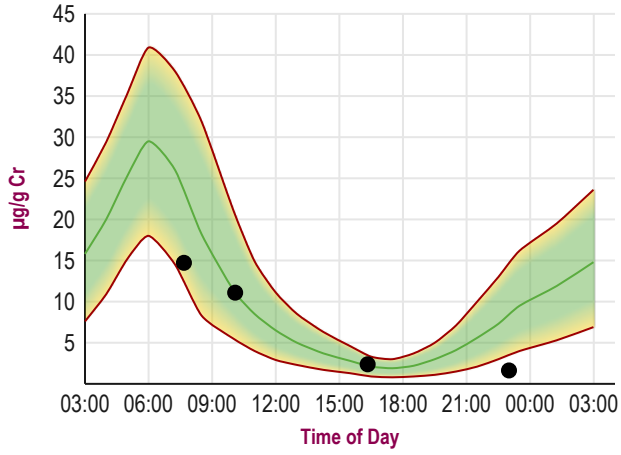
Urinary Free Cortisol



Urinary Free Cortisone



Urinary Melatonin (MT6s)



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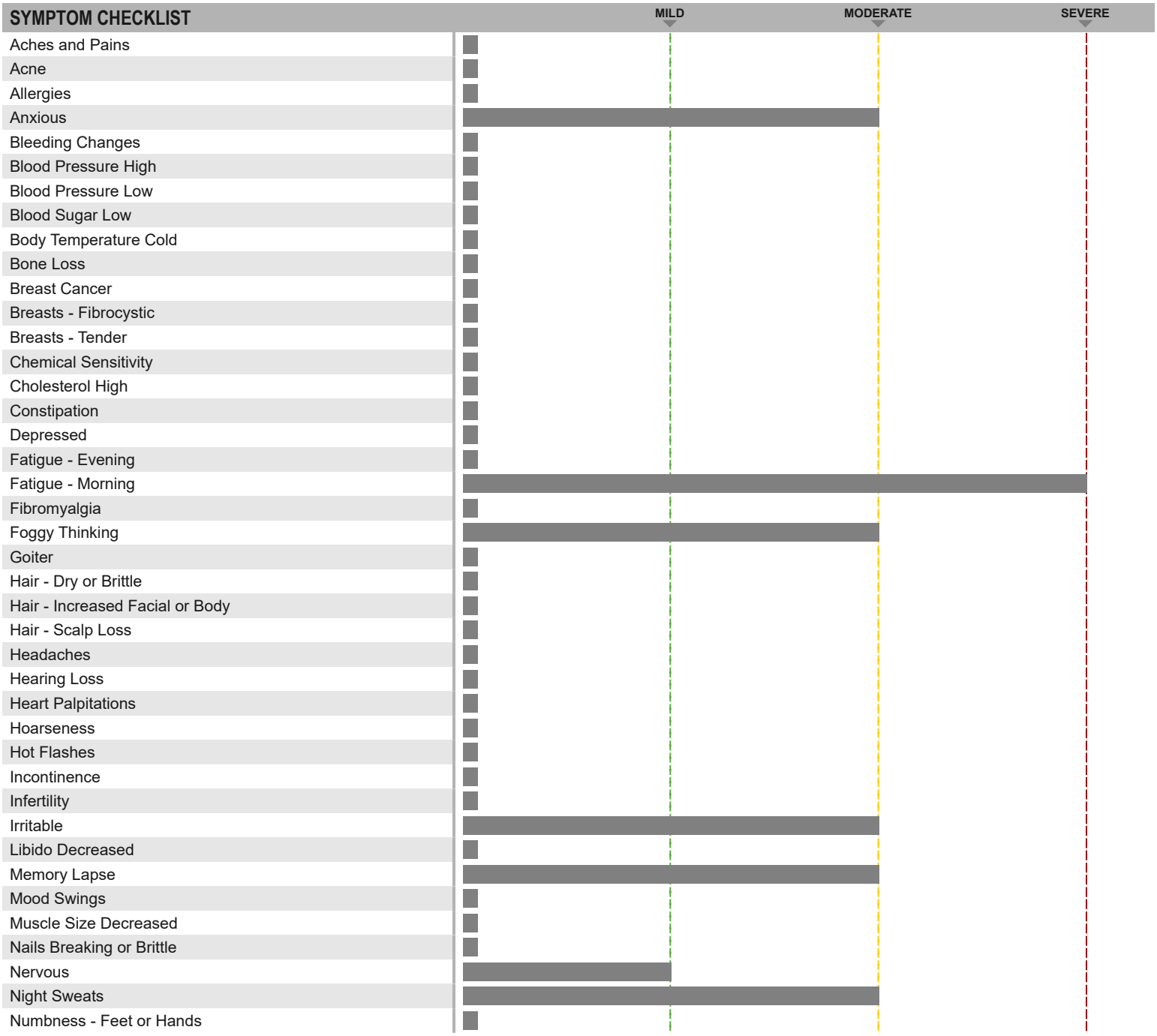
Disclaimer: Symptom Categories below show percent of symptoms self-reported by the patient compared to total available symptoms for each category. For detailed information on category breakdowns, go to www.zrtlab.com/patient-symptoms.

SYMPTOM CATEGORIES	RESULTS | 07/30/18
Estrogen / Progesterone Deficiency	25%
Estrogen Dominance / Progesterone Deficiency	7%
Low Androgens (DHEA/Testosterone)	11%
High Androgens (DHEA/Testosterone)	2%
Low Cortisol	18%
High Cortisol	29%
Hypometabolism	6%
Metabolic Syndrome	0%



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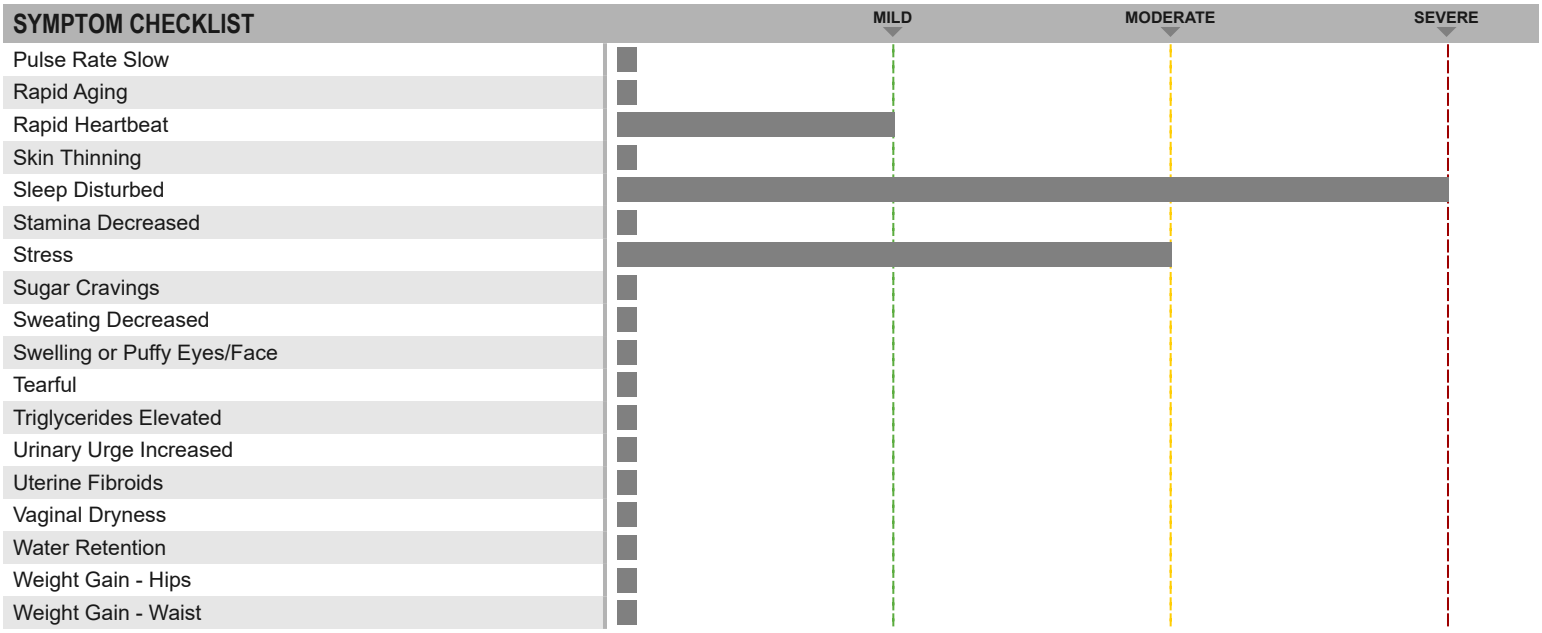

Lab Comments

URINARY FREE CORTISOL (F) AND CORTISONE (E)

Urinary free cortisol (F) and cortisone (E) are following a circadian rhythm but are outside (high) the reference ranges throughout most of the day. Levels of F and E are within normal reference ranges in the first urine void, but then rise sharply in the second void, and stay high throughout the remainder of the day.

In a normal individual without significant stressors F and E should follow the expected time-dependent (high morning, low night) circadian rhythms depicted in the graphs. In healthy individuals, F and E should be low in the first morning void, rise to peak level within several hours after awakening, and then begin a slow decrease to baseline levels by night. F and E reach a nadir about 2 am and then begin a slow rise throughout the early morning to peak again shortly after awakening. In this individual F and E follow an elevated circadian rhythm with levels that are much higher than range. The precipitous rise in F and E in the second urine void, followed by return to expected nighttime baseline strongly suggests use of a glucocorticoid (cortisol), an adrenal adaptogen that stimulates adrenal cortisol synthesis, or a medication that increases adrenal cortisol synthesis (none indicated).

A normal daily output of cortisol and normal circadian rhythm is essential to maintain normal metabolic activity, help regulate steady state glucose levels (important for brain function and energy production), and optimize immune function. Low or high cortisol, especially at the wrong time of day can disrupt the beneficial effects seen with physiological levels of cortisol. Persistently high levels of cortisol, particularly at night, and disrupted circadian rhythms contribute to sleep disturbances and increased risk for developing metabolic syndrome (Venneri MA. J Clin Endocrinol Metab, 2018; Bahrami-Nejad Z. Cell Metabolism 2018).

The most common stressors that can raise cortisol levels include psychological stressors (emotional), physical insults (surgery, injury, diseases), chemical exposure (environmental pollutants, excessive medications), hypoglycemia (low blood sugar), and pathogenic infections (bacterial, viral, fungal). Acute stressors such as exercise are expected to raise cortisol levels over the interval of the stressor, which is a normal response to the stressor(s) and is essential for optimal health. Chronic and persistent stressors that lead to chronic high cortisol production by the adrenal glands over time (months/years) cause excessive breakdown of normal tissues (muscle wasting, thinning of skin, bone loss) and immune suppression.

For additional information about strategies for supporting adrenal health and reducing stress and associated high cortisol, the following books are worth reading: "Adrenal Fatigue", by James L. Wilson, N.D., D.C., Ph.D.; "The Cortisol Connection", by Shawn Talbott, Ph.D.; "The End of Stress As We Know It" by Bruce McEwen; "The Role of Stress and the HPA Axis in Chronic Disease Management" by Thomas Guilliams, PhD.

MELATONIN METABOLITE 6-SULFATOXYMELATONIN (MT6s)

The melatonin metabolite, 6-sulfatoxymelatonin (MT6s) is within normal reference ranges throughout the first part of the day, but is low before bed at night. Otherwise MT6s is following an expected circadian rhythm. In a healthy individual MT6s should be at its highest level in the first morning void and then rise again with the onset of night, which is reflective of diminishing light. Melatonin in the night void is low, reflecting lower melatonin production during the night. Low night melatonin is usually caused by excessive exposure to light (e.g. TV, computers) before bed. During the night melatonin synthesis should peak and result in increased levels of the urinary metabolite MT6s that are measured in the first morning void.

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Some medications such as beta blockers (e.g. propranolol) used to control high blood pressure may also suppress melatonin synthesis during the night. Other medications such as oral contraceptives may increase melatonin synthesis. For a more comprehensive list of medications that can decrease or increase melatonin levels see: http://umm.edu/health/medical/altmed/supplement-interaction/possible-interactions-with-melatonin)

In a healthy individual the circadian rhythm of melatonin and cortisol are inversely related; as melatonin rises with darkness and peaks about 2-3 am, cortisol falls to its lowest level at this time. With morning and onset of light exposure, melatonin drops rapidly and cortisol rises again, peaking to its highest level about 30 min to 1 hr after waking. By late afternoon melatonin reaches a nadir and then gradually begins to rise again with nightfall and less light exposure. Cortisol continues to fall as melatonin rises again, when both hormones reach their nadir and peak, respectively, about 2-3 am. Melatonin synthesis by the pineal gland is controlled by light exposure, while cortisol synthesis is controlled by the hypothalamic-pituitary axis in response to stressors. While melatonin and cortisol have opposing circadian rhythms neither hormone directly controls the synthesis of the other.

Melatonin, produced by the pineal gland in the brain and released into the circulation, rapidly enters tissues throughout the body where it carries out its restorative properties. Melatonin synthesis decreases with aging and calcification of the pineal gland, the latter of which can result in very low production of melatonin. Melatonin is known to have many different beneficial effects in the body. It helps slow the aging process, is a potent anti-oxidant, inhibits formation and growth of tumors such as breast and prostate cancers, and helps regulate the synthesis of the sex-hormones estradiol and progesterone (melatonin increases progesterone and decreases estrogens) as well as their cellular receptors (decreases estrogen receptors and increases progesterone receptors). Melatonin down-regulates cellular estrogen receptors, which inhibits response of estrogen target tissues (e.g. breast, uterine, and prostate) to estrogens. Pineal calcification, which is accelerated with aging and diseases, including breast cancer, is associated with a loss of the normal circadian rhythm and very low melatonin production at night.

Low melatonin has been associated with many different dysfunctions and diseases such as immune dysfunction, neurodegenerative disorders (Alzheimer's disease, senile dementia), pain disorders, cardiovascular disease, cancers of the breast and prostate, and type 2 diabetes (Hardeland R. Aging and Disease 3 (2): 194-225, 2012). Low melatonin is also thought to contribute to obesity in people with insomnia or those who do night shift work. Low night time melatonin levels are seen commonly in breast and prostate cancer patients. The WHO's International Agency for Research on Cancer has concluded that "shift work that involves circadian disruption is probably carcinogenic to humans," because of the suppression of melatonin production by exposure to light during the night.

When melatonin is within normal range but sleep issues are problematic, this condition may, more likely, be related to excessive stress(ors) or to other hormonal imbalances (low or high) in estrogens (necessary for REM sleep, excessive levels can be over stimulating), progesterone (metabolite allopregnanolone binds GABA receptors and has a calming effect), cortisol (low or high levels can disrupt sleep) and/or low thyroid. If any of the symptoms of estrogen, progesterone, cortisol, or thyroid hormones appear to be imbalanced, consider testing them and correcting imbalances to facilitate better sleep.

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