

Patient: **SAMPLE**
PATIENT

DOB:

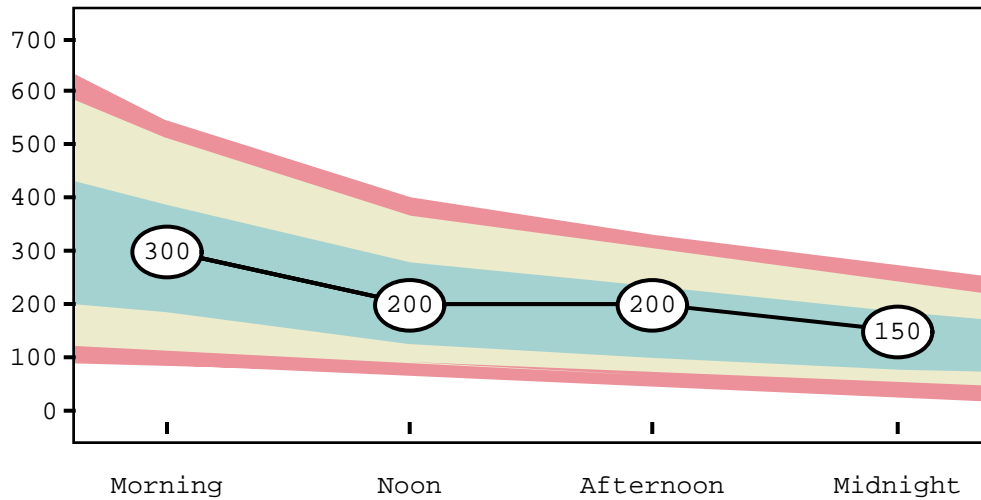
Sex:



4105 Male Hormones Plus - Saliva

Methodology: LIA

Testosterone



The Reference Range for each day is a statistical interval representing 95% or 2 Standard Deviations (2 S.D.) of the reference population. One Standard Deviation (1 S.D.) is a statistical interval representing 68% of the reference population. Values between 1 and 2 S.D. are not necessarily abnormal. Clinical Correlation is suggested.

Please note: Conversion calculation pg/ml=pMol/L / 3.47

Results

	Morning*	Noon*	Afternoon*	Midnight*
Patient Result (pmol/L) >>	300	200	200	150
Reference Range (pmol/L) *Based on Collection Times	110-513	89-362	66-304	52-239

Commentary

The performance characteristics of all assays have been verified by Genova Diagnostics, Inc. Unless otherwise noted with ♦, the assay has not been cleared by the U.S. Food and Drug Administration.

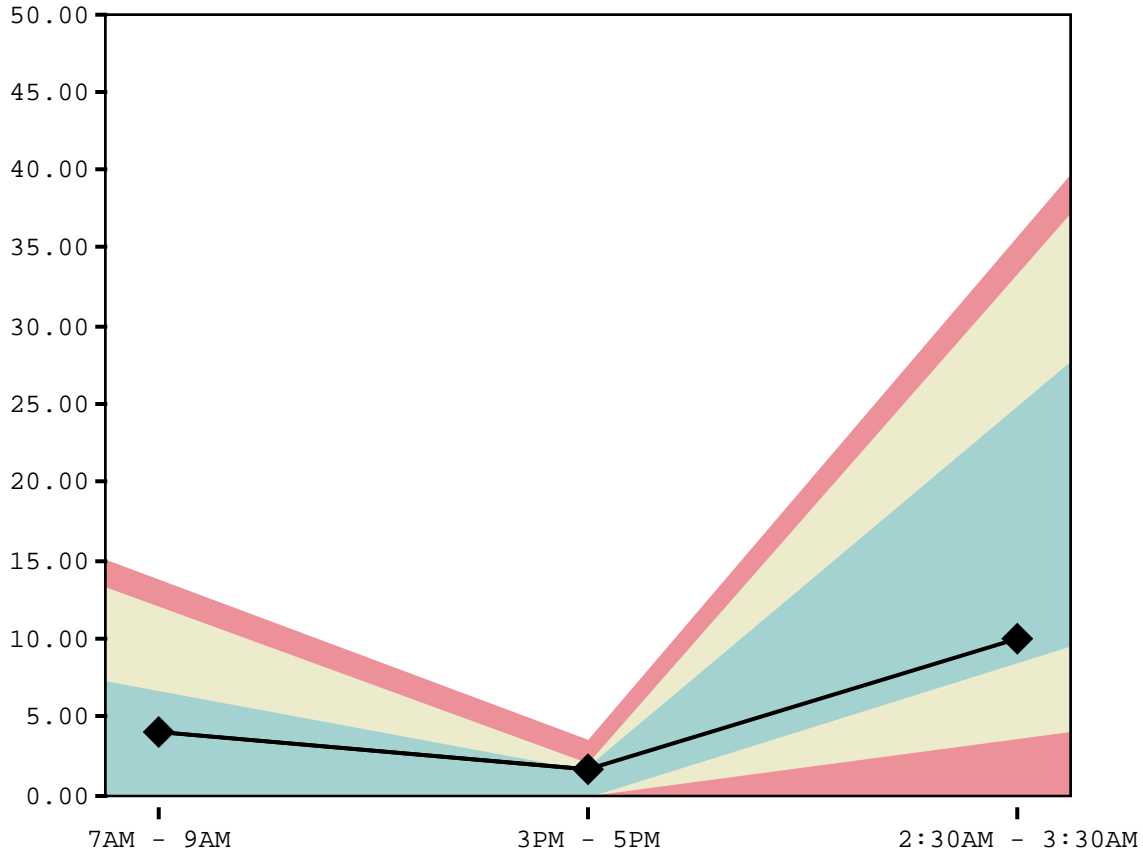
Commentary is provided to the practitioner for educational purposes, and should not be interpreted as diagnostic or as treatment recommendations. Diagnosis and treatment decisions are the practitioner's responsibility.

In the adult male, testosterone maintains the structure and function of the prostate, testes, seminal vesicles, and external male genitalia. In addition, testosterone affects lean body mass, bone density, hematopoiesis, libido and mood.

Testosterone levels are within reference range for all samples.

Methodology: EIA

Salivary Melatonin



Results

	7AM-9AM*	3PM-5PM*	2:30AM - 3:30AM*
Patient Results (pg/mL) >>	4.00	1.70	10.00
Reference Range (pg/mL)	<=12.12	<=1.97	3.71-33.38
<small>*Based on Collection Times</small>			

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Melatonin activity is normal throughout the sample period revealing a normal melatonin circadian rhythm.

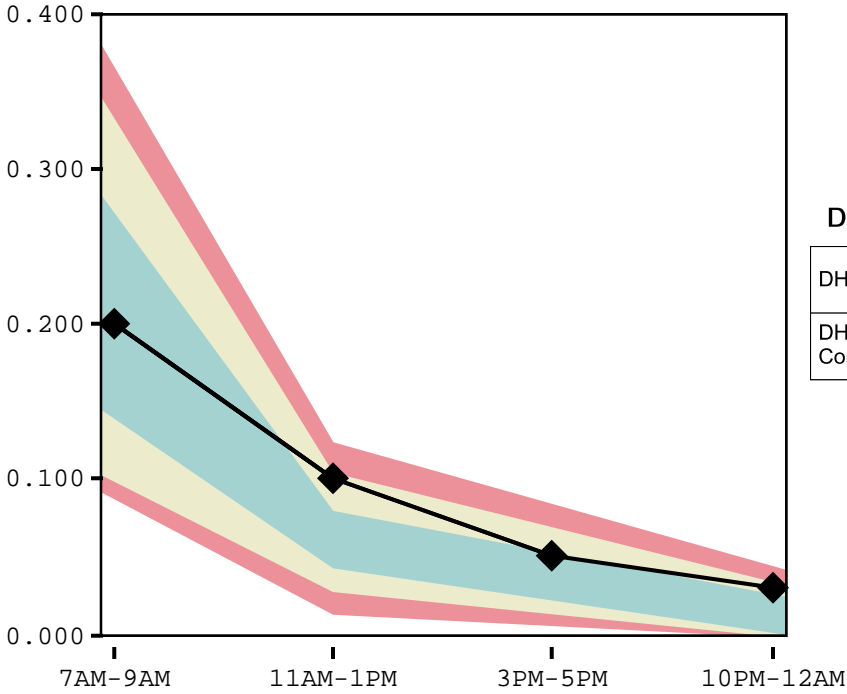
As well as playing a crucial role in sleep-wake cycles, melatonin influences other vital functions, including cardiovascular and antioxidant protection, endocrine function, immune regulation and body temperature.



Methodology: EIA

Salivary Cortisol and DHEA

Salivary Cortisol



DHEA

Reference Range

DHEA 7AM - 9AM◆	100	71-640 pg/mL
DHEA: Cortisol Ratio/10,000◆	500	358-2,538

Results

	7AM-9AM*	11AM-1PM*	3PM-5PM*	10PM-12AM*
Patient Result (mcg/dL) >>	0.200	0.101	0.050	0.030
Reference Range (mcg/dL) <small>*Based on Collection Times</small>	0.097-0.337	0.027-0.106	0.013-0.068	<=0.034
Actual Collection Time	7:00AM	11:05AM	3:00PM	10:03PM

Commentary

Cortisol reference ranges are for patients 18-65 years old.

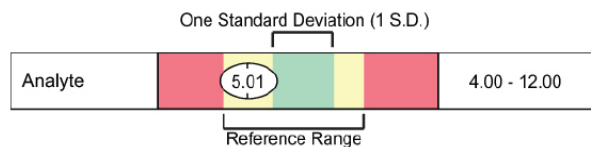
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The **Reference Range** is a statistical interval representing 95% or 2 Standard Deviations (2 S.D.) of the reference population.

Commentary

One Standard Deviation (1 S.D.) is a statistical interval representing 68% of the reference population. Values between 1 and 2 S.D. are not necessarily abnormal. Clinical correlation is suggested. (See example below)



Diurnal Cortisol Rhythm/Slope

The natural cortisol diurnal rhythm shows a peak within the first hour after awakening, a rapid decline over the morning hours, and then a tapering through the rest of the day before reaching a nighttime nadir.

A flat slope is characterized by low morning levels, blunted afternoon response and/or evening drop in cortisol levels. Flattened slopes are:

- Associated with a chronic stress burden, poor psychosocial functions, lack of HPA axis resiliency and lower perceived control over stress.
- Predictive of health outcomes, such as increased breast cancer mortality, increased coronary calcifications, and increased body mass index.
- Seen in Post-Traumatic Stress Disorder (PTSD), persistent fatigue, anxiety, depression, and Addison's Disease.

A "high flat" slope is characterized by high morning levels that fail to show a diurnal decrease.

- They can be a normal/appropriate response to a major stressor.
- High flat slopes might also suggest a challenge that seems insurmountable.

Timed Cortisol Measurements

Specific cortisol elevations throughout a diurnal rhythm may be caused by any number of acute mental, emotional and physical daily stressors, blood sugar dysregulation, exercise or pain. Abnormal results should be correlated with each patient's clinical presentation and specific daily routine.

Morning (7:00 AM – 9:00 AM) cortisol measurement reflects peak ACTH-mediated adrenal gland response.

- Exaggerated levels can be seen with exercise, blood sugar dysregulation, daily stressors, pain, and underlying adrenal hyperplasia or Cushing's syndrome.
- Low levels may reflect an inability to mount a peak response as is seen in adrenal dysfunction and/or down regulation from chronic stressors.

Mid-morning (11:00 AM – 1:00 PM) cortisol levels reflect an adaptive function of the HPA axis to daily routine.

- Elevated levels should be correlated with daily stressors, such as exercise, blood sugar dysregulation, perceived and actual lifestyle stressors and pain.
- Lower levels can reflect HPA axis dysfunction.

Afternoon (3:00 PM – 5:00 PM) cortisol is often reflective of glycemic control due to the post-prandial timing of collection.



Commentary

- Elevated levels can reflect any number of daily stressors as previously outlined.
- Low levels can reflect underlying HPA axis dysfunction.

Evening (10:00 PM – 12:00 AM) cortisol levels are a good indication of baseline HPA axis function since they represent the lowest level during the circadian rhythm.

- Elevated levels may be due to stress, exercise, alcohol, and specific lifestyle stressors.
- Elevated evening salivary cortisol is linked to insomnia
- High evening cortisol levels are also associated with various diseases such as diabetes, cardiovascular disease, hormonally driven cancers, and osteoporosis.

Treatment of elevated cortisol should be directed at the root cause of the stressor. Lifestyle modification with relaxation methods, dietary changes, pain management, and overall HPA axis support with nutrition and/or adaptogens can be helpful. Glandulars may be added if additional support is necessary.

References:

1. Clow A, Thorn L, Evans P, Hucklebridge F. The awakening cortisol response: methodological issues and significance. *Stress*. 2004;7(1):29-37.
2. Stalder T, Kirschbaum C, Kudielka BM, et al. Assessment of the cortisol awakening response: Expert consensus guidelines. *Psychoneuroendocrinology*. 2016;63:414-432.
3. Wust S, Wolf J, Hellhammer DH, Federenko I, Schommer N, Kirschbaum C. The cortisol awakening response-normal values and confounds. *Noise health*. 2000;2(7):79.
4. Fries E, Dettenborn L, Kirschbaum C. The cortisol awakening response (CAR): facts and future directions. *Int J Psychophysiol*. 2009;72(1):67-73.
5. Saxbe DE. A field (researcher's) guide to cortisol: tracking HPA axis functioning in everyday life. *Health Psychol Rev*. 2008;2(2):163-190.