

Hormone Testing

Saliva Hormone Testing

Salivary hormone testing offers easy, non-invasive specimen collection that is performed in the comfort of the patient's home. Salivary reproductive hormones and DHEA are measured from a pooled combination of a 4-point saliva collection. This process better reflects the overall physiologic hormone levels. Salivary hormone testing is frequently used to assess baseline or "free" hormone levels.

Steroid hormones are primarily bound up by serum proteins, making them unavailable for use by cells.^{1,2} Only 1-5% is unbound, or "free", and available for binding to cellular hormone receptors. The free-form is the most biologically active and easily measured in saliva, making salivary testing a popular method for assessing biologically active hormone levels.

Profiles

Test	Item	Biomarkers
Endocrine Essential I	7070	Estradiol, Progesterone, Testosterone, DHEA, Cortisol
Endocrine Essential II	7071	Estradiol, Progesterone, Testosterone, DHEA, Cortisol x 4
Adrenal Rhythm	7000	Cortisol x 4
Adrenal Health	7100	Cortisol x 4, DHEA
Endocrine Health Basic	7027	Cortisol x 4, DHEA, Estradiol, Estrone, Progesterone, Testosterone
Comprehensive Endocrine	7127	Cortisol x 4, DHEA, Estradiol, Estrone, Estriol, Progesterone, Testosterone, Melatonin
Melatonin Rhythm	7033	Melatonin x 3
Build Your Own	7900	8 different parameters available

Serum Hormone Testing

Serum hormone testing is suggested for patients utilizing hormone therapy, including bioidenticals and/or to evaluate total (free and bound) hormone levels.

Profiles

Test	Item	Biomarkers
Comprehensive Endocrine	7044	Cortisol, DHEA-S, Estradiol, Estrone, Estriol, Progesterone, Testosterone (Total), Luteinizing Hormone, Follicle-Stimulating Hormone, Prolactin, Sex Hormone-Binding Globulin
Thyroid Profile I	7023	Triiodothyronine (ft3), Thyroxine (ft4), Thyroid-Stimulating Hormone (TSH)
Thyroid Profile II	7024	ft3, ft4, TSH, Thyroid Peroxidase (TPO)*
Thyroid Profile III	7025	ft3, ft4, TSH, TPO, Thyroglobulin Ab (tG)
Thyroid Profile IV	7022	ft3, ft4, TSH, TPO, tG, Reverse Triiodothyronine (rT3)
Build Your Own	7950	18 different parameters available

* Thyroid peroxidase and Thyroglobulin assess antibodies.

Imbalances in hormones are commonly associated with:

- Menopause
- Mood Swings
- Infertility
- Weight Gain
- Irregular Cycles
- Anxiety
- Acne
- Depression
- PMS
- Amenorrhea
- Lethargy
- Thin or Dry Skin
- Headaches
- Hirsutism
- Sleep Issues
- Hot Flashes
- Low Libido
- Ovarian Cysts
- Andropause
- Adrenal Fatigue

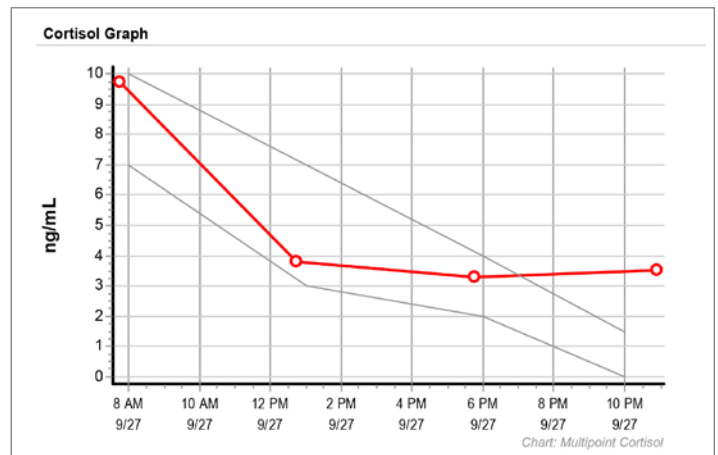
Serum testing may be used to further assess:

- Endocrine Disorders
- Cancer Risk
- Thyroid Disorders
- Endometriosis
- Osteoporosis Risk
- Hypertension
- Hormone Therapies

Sample Report (Comprehensive Endocrine - Saliva)

Sex Hormones					
Parameter	Result	Units	Collection	Reference Range	Observed Range
Estradiol Saliva	<1.1	pg/mL	9/27/2013 7:45 AM to 9/27/2013 10:55 PM	Follicular: <1.1 - 3.0 Mid-cycle: <1.1 - 6.1 Luteal: <1.1 - 4.2 Post-menopausal: <1.1 - 2.8 Male: <1.1 - 2.0 Range effective 10/1/13	HRT- Oral: 1.7 - 23.3 Patch: 1.8 - 4.9 Cream: 2.5 - 40.2
			9/27/2013 7:45 AM to 9/27/2013 10:55 PM	Female: 16.9 - 36.5 Male: 16.9 - 36.5 Range effective 10/1/13	
Estrone Saliva	30.7	pg/mL	9/27/2013 7:45 AM to 9/27/2013 10:55 PM	Female: 16.9 - 36.5 Male: 16.9 - 36.5 Range effective 10/1/13	
Estriol Saliva	<5.4	pg/mL	9/27/2013 7:45 AM to 9/27/2013 10:55 PM	Non-pregnant Female: <5.4 - 28.1 Range effective 10/1/13	HRT- Cream: 2.0 - 168.0
			9/27/2013 7:45 AM to 9/27/2013 10:55 PM	Follicular: <19.4 - 150.0 Luteal: 22.0 - 240.0 Post-menopausal: <19.4 - 118.3 Male: <19.4 - 57.4 Range effective 10/1/13	HRT- Oral: 65.3 - 450.1 Cream: 183.7 - 1,960.9
Progesterone Saliva	22.1	pg/mL	9/27/2013 7:45 AM to 9/27/2013 10:55 PM	Follicular: <19.4 - 150.0 Luteal: 22.0 - 240.0 Post-menopausal: <19.4 - 118.3 Male: <19.4 - 57.4 Range effective 10/1/13	HRT- Oral: 65.3 - 450.1 Cream: 183.7 - 1,960.9

Ranges were established based on the 95% confidence interval for apparently healthy adult subjects.



■ 95th Percentile (Reference range) — Mean value (Reference range) ○ Test results

Hormones

Cortisol	A regulator of glucose metabolism and the body's response to stress. During times of stress, cortisol levels increase and accelerate the breakdown of proteins to provide the fuel to maintain body functions.
DHEA	A steroid precursor produced by the adrenal gland and converted to testosterone or the estrogens by the body's tissues. Adequate DHEA levels give the body the building blocks necessary to produce these hormones. DHEA levels decrease with age.
Dihydrotestosterone (DHT)	A metabolite of testosterone and is believed to be the hormonally active form of testosterone in males. The majority of dihydrotestosterone is produced in androgen target glands like the prostate, with small amounts produced by the testes, skin, and submaxillary glands.
Estradiol (E2)	Responsible for the development of female sex organs and characteristics. In adults, estradiol slows the breakdown of bone. Estradiol levels fall dramatically in menopause. Estradiol may help maintain skeletal health and may reduce the risk of cardiovascular disease.
Estrone (E1)	Relevant to health and disease states because of its conversion to estrone sulfate (a long-lived derivative). Estrone sulfate acts as a reservoir that can be converted as needed to the more active estradiol. Estrone is the only one of the three estrogens present in significant quantities in post-menopausal women.
Follicle-Stimulating Hormone (FSH)	Produced by the anterior pituitary gland in both females and males. In females, FSH stimulates the growth and development of ovarian follicles and promotes secretion of estrogen by ovaries. In males, FSH is required for sperm production.
Luteinizing Hormone (LH)	Produced by the anterior pituitary gland in both females and males. In females, LH is produced in response to a spike in estradiol and is responsible for triggering ovulation, formation of corpus luteum in the ovary, and ovarian secretion of progesterone. In males, LH stimulates cells in the testes to produce testosterone.
Melatonin	A hormone whose levels follow a precise circadian pattern with high levels at night and low to undetectable levels during the day. This fluctuation controls the body's sleep-wake cycle. Decreased levels of melatonin during the night can cause difficulty falling asleep and reduce the restfulness of sleep.
Progesterone	A steroid hormone responsible for the changes in the uterine endometrium during the second half of the menstrual cycle in preparation for implantation. Progesterone has been described as the "feel-good" hormone and low levels can cause irritability and anxiousness.
Prolactin	Primarily associated with the stimulation of breast development and lactation. In males, prolactin promotes spermatogenesis in the testes.
Sex Hormone-Binding Globulin (SHBG)	A protein that binds to the sex hormones testosterone and estradiol. When bound, hormones are biologically inactive. Inadequate testosterone and estradiol activity may result from elevated levels of SHBG.
Testosterone	Male hormone which is mainly produced by the testes, however small quantities are made in other organs (eg. adrenal gland). Testosterone helps build lean muscle, improves skin tone, and increases libido.
Thyroglobulin (Tg)	A protein used by the thyroid gland to produce the hormones thyroxine and triiodothyronine.
Thyroid Peroxidase (TPO)	An enzyme that liberates iodine for binding to thyroglobulin to produce thyroxine and triiodothyronine. Antibodies to TPO can result in damage to the thyroid gland and result in thyroid dysfunction.
Thyroid-Stimulating Hormone (TSH)	Produced by the anterior pituitary gland. TSH stimulates secretion of the thyroid hormones thyroxine and triiodothyronine and also promotes growth of the thyroid gland.
Thyroxine (T4)	A thyroid hormone that regulates the metabolism of all cells and tissues in the body.
Triiodothyronine (T3)	Released from the thyroid gland along with thyroxine and is also converted from T4 after release into circulation. T3 regulates growth and development, metabolism, and body temperature.

References:

1. Gröschl, M. Current Status of Salivary Hormone Analysis. Clinical Chemistry 2008. 54:11.
2. Harris, et al. Maternity blues and major endocrine changes: Cardiff puerperal mood and hormone study II. BMJ. 1994. 308:949-953.



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