



Testing Catalog

A COMPLETE GUIDE TO ZRT LABORATORY

*The only way to know if hormones
are in balance is to test them.*

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About ZRT Laboratory



The only way to know if hormones are in balance is to test them.

Therefore, it's vital to partner with a lab that understands subtle differences between testing methods, and has both the experience and technology to deliver the most accurate results.

With numerous peer-reviewed studies validating that hormone test results support symptomatology, science now recognizes that hormones are a fundamental part of treating the whole body. Evidence shows that hormonal imbalances are the root cause of many chronic health issues.

With 20 years of experience and results from over 11 million tests, ZRT Laboratory is a recognized leader in innovative and meaningful hormone and wellness testing, being the first to commercialize many tests now considered mainstream. Health care providers in all 50 states and 96 countries, and research teams worldwide, use our tests, including the CDC, the NIH and many renowned universities.

► Est. 1998 – Beaverton, OR

ZRT Laboratory is a CLIA-certified commercial and research laboratory founded by breast cancer researcher David Zava, PhD. ZRT Laboratory has pioneered innovative testing methods for hormones, neurotransmitters, heavy metals and more, offering health care professionals convenient testing options in different body fluids including saliva, dried blood spot, dried urine, and serum. Since it began, ZRT has maintained a singular focus: providing comprehensive and meaningful test results that assist health care providers, and their patients, in making informed treatment decisions.



DR. DAVID ZAVA
FOUNDER

Breast cancer researcher and biochemist David Zava, PhD, founded ZRT in 1998. His desire to innovate the science of hormone testing provides the guiding force behind development of all ZRT's technology.

A Note from our Founder

We are the science behind testing.

Hormones produced by endocrine glands (ovaries, testes, thyroid, pituitary, pancreas, etc.) are released into the bloodstream where they bind to carrier proteins and are slowly released into tissues throughout the body. Various body fluids have been successfully used to monitor the levels of hormones, which include blood from venipuncture (serum or plasma), capillary whole blood (blood spot), saliva, and urine.

Blood is traditionally collected by venipuncture and separated into serum or plasma. Capillary blood can also be collected from the fingertip or heel (in infants) and drops deposited onto filter paper and dried, which is referred to as dried blood spot (DBS). Blood provides a convenient means to measure levels of steroid and peptide hormones; however, it measures total circulating hormone including hormone bound to carrier proteins and requires a separate calculation to determine how much of the hormone is bioavailable to target cells. Also, diurnal patterns of hormone production cannot be measured conveniently in blood.

Saliva is a convenient matrix for measuring steroid hormone levels because the sample collection is simple and non-invasive (just spit into a tube) and the amount of steroid is representative of the bioavailable fraction available to tissues – about 1-5% of the total circulating in blood. Because of the lower concentration it challenges methods of detection and requires 10- to 100-fold greater sensitivity in detection methods. Saliva cannot be used to test peptide hormones.

Urine is also a convenient method for measuring total hormone production; it contains a high concentration of steroid metabolites and is simple to collect. Dried urine is even easier to collect at only four time points during the day and permits evaluation of diurnal patterns of hormone production. Disadvantages are that it only looks at metabolites scheduled for disposal by the body. It is not possible to determine how much active hormone is present in circulation. Also, it must be processed by enzyme digestion and is time consuming. Topical hormones cannot be monitored in urine as they are mostly excreted in bile and very little is detected in urine.

ZRT has developed convenient, at-home collection methods for all these options – giving maximum flexibility and optimal results for health care providers.

David I. Zava

The ZRT Difference

When choosing a laboratory, it's crucial to partner with a group that has unmatched expertise and state-of-the-art technology to deliver the **most accurate results** and make it easy for you to get on board.

Advancing the Science of Testing

- ✓ Ongoing clinical research, published in peer-reviewed journals and presented at scientific meetings, in collaboration with investigators around the world including the CDC, NIH, the military and academic research centers.

Accuracy

- ✓ We ensure accurate test results for low-concentration hormones such as estradiol by using an extraction process for saliva testing.
- ✓ Precision and accuracy are maintained with rigorous proficiency, testing both internally and externally.

Flexibility & Convenience

- ✓ We offer all four test mediums (saliva, blood spot, dried urine, and serum) and a varied menu of tests, allowing maximum flexibility and optimal timing of sampling.
- ✓ First-morning saliva sampling measures peak hormone levels and ensures correspondence with supplementation ranges that depend on time since last hormone use. No need to collect four daily samples except when testing diurnal cortisol.
- ✓ We determine reference ranges for individual patient ages, menstrual status, and hormone supplementation, so patients don't need to stop taking hormones to use our testing.
- ✓ Turnaround time 3-5 business days.

ZRT's Symptom Checklists will help identify which patients can benefit from testing and what type of testing is best for them - download those at www.zrtlab.com/resources

Comprehensive Test Reports

- ✓ Test results correlate hormone levels with reported symptoms and hormone supplementation.
- ✓ All reports are physician-reviewed with individualized comments, and include previous test results to compare current and past hormone levels to monitor patient progress.
- ✓ Secure, online access to test reports.

Provider Support & Education

- ✓ On-call clinical consultants available without appointment to consult with medical practitioners regarding hormone testing and bioidentical treatment approaches.
- ✓ Complimentary educational webinars for medical professionals presented by physician experts in the areas of physiology and endocrinology; complimentary patient education webinars.
- ✓ Patient education brochures and point-of-sale displays.
- ✓ Online access to resource materials, webinars, and reference documents.
- ✓ Discounted yearly testing for provider employees.



Overview of Kits | Standard Kits



SALIVA

- Female / Male Saliva Profile I: E2, Pg, T, DS, C
- Female / Male Saliva Profile II: E2, Pg, T, DS, Cx2
- Female / Male Saliva Profile III: E2, Pg, T, DS, Cx4
- LCMS Saliva Steroid Profile: E2, E3, E1, EE, PregS, Pg, AlloP, 17OHPg, Adione, T, DHT, D, DS, 7keto, 11DC, C, Cn, Ccn, Ald, Mel, ANZ, FIN, LTZ
- Hormone Trio - Saliva: E2, Pg, T
- Adrenal Stress: DS, Cx4
- Diurnal Cortisol: Cx4



DRIED BLOOD SPOT

- Female Blood Profile I: E2, Pg, T, SHBG, DS, C
- Female Blood Profile II: E2, Pg, T, SHBG, DS, C, TSH, fT3, fT4, TPOab
- Male Blood Profile I: E2, T, PSA, SHBG, DS, C
- Male Blood Profile II: E2, T, PSA, SHBG, DS, C, TSH, fT3, fT4, TPOab
- Hormone Trio - Blood: E2, Pg, T
- Vitamin D: 25-OH D2, 25-OH D3, total
- CardioMetabolic Profile: In, hsCRP, HbA1c, TG, CH, HDL, LDL, VLDL
- Toxic & Essential Elements - Blood: Zn, Cu, Mg, Se, Cd, Hg
- Essential Thyroid Profile: TSH, fT3, fT4, TPOab
- Elite Thyroid Profile: T4, Tgbn, TSH, fT3, fT4, TPOab



SALIVA + BLOOD

- Comprehensive Female Profile I: Saliva: E2, Pg, T, DS, Cx4
Blood Spot: TSH, fT3, fT4, TPOab
- Comprehensive Female Profile II: Saliva: Cx4
Blood Spot: E2, Pg, T, SHBG, DS, TSH, fT3, fT4, TPOab
- Comprehensive Male Profile I: Saliva: E2, T, DS, Cx4
Blood Spot: PSA, TSH, fT3, fT4, TPOab
- Comprehensive Male Profile II: Saliva: Cx4
Blood Spot: E2, T, SHBG, PSA, DS, TSH, fT3, fT4, TPOab



BLOOD + URINE

- Comprehensive Thyroid Profile: Dried Urine: I, Se, Br, Li, As, Cd, Hg, Crtn
Blood Spot: T4, Tgbn, TSH, fT3, fT4, TPOab
- Comprehensive Toxic & Essential Elements
Blood Spot: Zn, Cu, Mg, Se, Cd, Hg
Urine: I, Br, Se, Li, As, Cd, Hg, Crtn



BLOOD DRAW

- Female Serum Hormones Basic Profile: E2, Pg, T, SHBG, DS, C, TSH
- Female Serum Hormones Advanced Profile: E2, Pg, T, SHBG, DS, C, TSH, fT3, fT4, TPOab, FSH, LH, FER
- Male Serum Hormones Basic Profile: E2, T, PSA, SHBG, DS, C, TSH
- Male Serum Hormones Advanced Profile: E2, T, PSA, SHBG, DS, C, TSH, fT3, fT4, TPOab, LH, PRL, FER

Overview of Kits | Specialty Kits



NEUROTRANSMITTERS

- NeuroAdvanced Profile: Dried Urine: GABA, Glu, Gly, DA, Epi, NE, HIST, 5-HT, PEA, DOPAC, HVA, 5-HIAA, NMN, VMA, Trp, Kyn, 3-OHkyn, Tau, Gln, His, N-MeHist, Tyra, KynAc, Xanth, Tyr & Crtn



URINE METABOLITES

- Adrenal Profile
- Estrogen Essential Profile
- Estrogen Elite Profile
- Basic Metabolites Profile
- Advanced Metabolites Profile



SLEEP BALANCE

- Dried Urine: Melatonin (MT6s) x4, Free Cortisol x4, Free Cortisone x4, Crtn



ADRENAL STRESS

- Saliva: DS, Cx4



CORTISOL AWAKENING RESPONSE

- Saliva: DS, Cx6



MENSTRUAL CYCLE MAPPING

- Dried Urine: E1G, PDG, LH, Crtn



FERTILITY

- Saliva: Cx4
Blood Spot: E2, Pg, T, SHBG, DS, TSH, fT3, fT4, TPOab, FSH, LH



HEAVY METALS & ESSENTIAL ELEMENTS

- Iodine Panel
I, Crtn
- Toxic & Essential Elements - Urine
I, Br, Se, Li, As, Cd, Hg, Crtn
- Toxic & Essential Elements - Blood
Zn, Cu, Mg, Se, Cd, Hg
- Comprehensive Toxic & Essential Elements
Blood Spot: Zn, Cu, Mg, Se, Cd, Hg
Urine: I, Br, Se, Li, As, Cd, Hg, Crtn
- Elite Thyroid Profile
T4, Tgbn, TSH, fT3, fT4, TPOab



WEIGHT MANAGEMENT

- Saliva: E2, Pg, T, DS, Cx4
Blood Spot: TSH, 25-OH D2, 25-OH D3, HbA1c, In

The Wellness Suite



WELLNESS METRICS

- Saliva: E2, Pg, T, DS, Cx4
Blood Spot: TSH, D2/D3, In, HbA1c



FITNESS METRICS

- Blood Spot: E2, Pg, T, DS, C, SHBG, TSH, D2/D3, TG, CH, HDL, LDL, VLDL



ELITE ATHLETE METRICS

- Saliva: E2, Pg, T, DS, Cx4
Blood Spot: TSH, fT3, fT4, TPOab, D2/D3

About ZRT Laboratory Test Kits

Our all-inclusive test kits are simple and convenient for both patients and providers. All kits (except serum) are designed for private sample collection at home, at the optimal time.

Orders can be placed online at www.myZRT.com or by phone at 866.600.1636 or +1.503.466.2445.

Multiple Testing Options – Your Choice

ZRT offers testing in four different test media so you can choose the **best option** for your and your patient's needs. Here is a guide to the merits of each test medium.



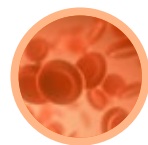
SALIVA TESTING

Suitable for:

- Assessing “free” (unbound to carrier proteins) hormone levels
- Monitoring hormone replacement given orally, topically, vaginally or via pellets
- Collecting multiple samples during a day, e.g., determining diurnal cortisol levels for adrenal stress assessment

Not suitable for:

- Monitoring sublingual/troche hormone replacement
- Patients with dry mouth, e.g., due to Sjögren's syndrome



DRIED BLOOD SPOT TESTING

Suitable for:

- Assessing total circulating hormone levels (free plus protein-bound)
- Patients with dry mouth and/or children who may have difficulty collecting saliva
- Monitoring hormone replacement therapy (oral, sublingual, pellet)
- Assessing thyroid health, fertility parameters, and cardiometabolic risk factors

Dried Blood Spot is better for:

- Assessing interstitial tissue/capillary hormone levels reflecting topical or vaginal hormone supplementation
- Toxic and nutritional elements requiring a whole blood sample
- Self-collection of sample at home at a time convenient to the patient and avoiding a trip to the phlebotomist



DRIED URINE TESTING

Suitable for:

- Measuring steroid hormone metabolites, e.g., for breast cancer risk assessment
- Determining toxic element exposure and iodine/selenium sufficiency for thyroid health
- Determining diurnal cortisol production at four time points for stress assessment
- Assessing nocturnal and diurnal melatonin production

Not suitable for:

- Monitoring topical or intravaginal hormone replacement therapy



SERUM TESTING

Suitable for:

- Measuring a wide variety of analytes including steroid, thyroid and peptide hormones (e.g., LH and FSH)
- Testing of sex hormones, which can be used to determine circulating endogenous hormone levels in women who are not using topical or vaginal hormone supplementation
- Offering a suitable alternative to measuring hormones in saliva, dried blood spot and dried urine

Testing for Steroid Hormone Levels

Today's health care practitioners face the challenge of helping patients cope with hormone imbalance. Accurate testing is the best way to make sure hormone dosing is optimal.

To learn more, visit www.zrtlab.com/sample-types/hormone-testing-for-different-supplementation-types/

Our Comprehensive Range of *Test Specialties*

Reproductive Hormone Testing Pages 11-18

Keeping hormones in balance means testing to ensure levels are within physiological, age-appropriate ranges. Our range of testing options covers your assessment needs for menopause, andropause, menstrual health, fertility, and breast cancer risk.

- ▶ Female/Male Saliva Profiles I, II & III
- ▶ Female Blood Profiles I & II
- ▶ Male Blood Profiles I & II
- ▶ Hormone Trio – Saliva
- ▶ Hormone Trio – Blood Spot
- ▶ Comprehensive Female Profiles I & II
- ▶ Comprehensive Male Profiles I & II
- ▶ Female Serum Hormones – Basic & Advanced Profiles
- ▶ Male Serum Hormones – Basic & Advanced Profiles
- ▶ Fertility Profile
- ▶ Menstrual Cycle Mapping
- ▶ LCMS Saliva Steroid Profile
- ▶ Urine Metabolites

Adrenal/Stress Testing Page 19

Assessment of diurnal cortisol levels is key to detecting adrenal dysfunction that leads to many stress-related health problems.

- ▶ Diurnal Cortisol Profile
- ▶ Adrenal Stress Profile
- ▶ Cortisol Awakening Response Profile

Thyroid Testing Pages 20-21

Proper thyroid function is essential to maintaining the body's metabolic activity and regulating energy. Our profiles identify overt and subclinical thyroid disease and monitor thyroid replacement. Get a more complete picture with profiles that combine thyroid tests with our other hormone testing or with heavy metals and essential elements tests that affect thyroid health.

- ▶ Essential & Elite Thyroid Profiles
- ▶ Comprehensive Thyroid Profile
- ▶ Comprehensive Female Profiles I & II
- ▶ Comprehensive Male Profiles I & II

Heavy Metals & Essential Elements Testing Pages 22-24

Exposure to dangerous heavy metals or insufficiency of nutritional elements affects health profoundly. Testing elements in the most appropriate sample type is important for proper assessment.

- ▶ Iodine Panel in Dried Urine
- ▶ Toxic & Essential Elements – Urine
- ▶ Toxic & Essential Elements – Blood
- ▶ Comprehensive Toxic & Essential Elements Profile

Neurotransmitter Testing Pages 25-27

Testing neurotransmitters can help pinpoint imbalances leading to many mood disorders. Choose our NeuroAdvanced Profile alone or add on any of the available options – sex hormones, diurnal cortisol, elements, or melatonin – to get a more complete picture, giving practitioners a diagnostic edge to help identify treatment options.

- ▶ NeuroAdvanced Profile

Wellness Testing Pages 28-29

Optimal wellness means getting to grips with modifiable lifestyle factors that can have a big impact on health. Whether assessing vitamin D deficiency, risk factors for cardiovascular disease (CVD) and diabetes, barriers to healthy sleep, or hormone imbalances hindering your path to fitness, our profiles offer multiple testing options.

- ▶ Weight Management Profile
- ▶ Sleep Balance Profile
- ▶ CardioMetabolic Profile
- ▶ Wellness Metrics Profile
- ▶ Fitness Metrics Profile
- ▶ Elite Athlete Metrics Profile

Methylation & Memory Testing Pages 30-31

Nutritional factors involved in methylation pathways are vital to the health of the cardiovascular and nervous systems and to safe steroid hormone metabolism. Our profiles assess these factors as well as multiple other hormones. If these are not at optimal levels, risks for CVD and dementia can increase.

- ▶ Methylation Profile
- ▶ Methylation & Memory – Basic & Advanced Profiles

Female / Male Saliva Profiles I, II & III

Three convenient saliva profiles are offered to assess sex and adrenal hormone levels. These profiles test waking levels of estradiol, progesterone, testosterone, DHEA-S, and cortisol, while Profile II includes a bedtime cortisol test and Profile III a full diurnal cortisol profile at four time points during the day (morning, noon, evening, night).

- ✓ **Saliva Profile I includes:** E2, Pg, T, DS, C
- ✓ **Saliva Profile II includes:** E2, Pg, T, DS, Cx2
- ✓ **Saliva Profile III includes:** E2, Pg, T, DS, Cx4

Consider for Women:

Baseline levels before Hormone Replacement Therapy (HRT), amenorrhea, PMS, DUB, estrogen dominance symptoms, hypogonadism, sexual dysfunction, osteoporosis, fibrocystic breast disease, infertility screening, PCOS screening, anovulation, menopausal symptoms, screening for adrenal fatigue. Ideal for monitoring HRT dosing.

Consider for Men:

Monitor for estrogen dominance, hypogonadism, andropause, fatigue, low libido, ED, infertility, osteoporosis screening, and adrenal dysfunction.

Female Blood Profiles I & II

Two dried blood spot (DBS) profiles are offered for women: Profile I tests sex and adrenal hormone levels in blood, as an alternative to Saliva Profile I for those women who have difficulty producing enough saliva for testing, or who are using sublingual hormones that might interfere with the saliva test. SHBG is included in the profile so that free (unbound) testosterone can be calculated, since most of the testosterone circulating in the blood is bound to SHBG. Profile II includes the same tests as Profile I with the addition of the Essential Thyroid Profile tests.

- ✓ **Female Blood Spot Profile I includes:** E2, total; Pg, total; T, total; SHBG; DS; C
- ✓ **Female Blood Spot Profile II adds:** TSH, fT3, fT4, TPOab
- ✓ **Female Serum Profile includes:** E2, Pg, T, SHBG, DS, C, TSH, fT3, fT4, TPOab

Female Blood Profile I tests the primary female sex hormones and their major binding globulin, and screens for adrenal health through morning cortisol.

Consider for assessment of total baseline levels before hormone replacement therapy, adrenal fatigue, amenorrhea, anovulation, DUB, estrogen dominance symptoms, fibrocystic breast disease, hypogonadism, infertility screening, menopausal symptoms, osteoporosis, PCOS screening, PMS, sexual dysfunction.

Female Blood Profile II is a more comprehensive assessment of hormonal and thyroid imbalances. The Female Serum Profile includes the same tests.

Male Blood Profiles I & II

Two DBS profiles are offered for men: Profile I tests sex and adrenal hormone levels in blood, and includes a PSA test to help assess prostate health. Profile II includes the same tests as Profile I with the addition of the Essential Thyroid Profile tests.

- ✓ **Male Blood Spot Profile I includes:** E2, total; T, total; PSA; SHBG; DS; C
- ✓ **Male Blood Spot Profile II adds:** TSH, fT3, fT4, TPOab
- ✓ **Male Serum Profile includes:** E2, T, PSA, SHBG, DS, C, TSH, fT3, fT4, TPOab

Male Blood Profile I tests the primary male sex hormones and their major binding globulin, and screens for adrenal health through morning cortisol.

Consider for monitoring for estrogen dominance, hypogonadism, andropause, fatigue, low libido, ED, infertility, osteoporosis screening, adrenal dysfunction.

Male Blood Profile II is a more comprehensive assessment of hormonal and thyroid imbalances. The Male Serum Profile includes the same tests.

- ▶ *Don't need PSA? Select one of the female profiles instead.*

Hormone Trio - Saliva

Combines three of our most popular saliva hormone tests at a lower price than individual tests.

- ✓ **Hormone Trio includes:** E2, Pg, T

Consider for Women:

Baseline levels before HRT, amenorrhea, PMS, DUB, estrogen dominance symptoms, hypogonadism, sexual dysfunction, osteoporosis, fibrocystic breast disease, PCOS screening, anovulation, menopausal symptoms. Ideal for monitoring HRT dosing.

Consider for Men:

Monitor for estrogen dominance, hypogonadism, andropause, fatigue, low libido, ED, osteoporosis screening.

Hormone Trio - Blood Spot

Combines three of our most popular hormone tests at a lower price than individual tests.

- ✓ **Hormone Trio includes:** E2, Pg, T

Consider for Women:

Baseline levels before HRT, amenorrhea, PMS, DUB, estrogen dominance symptoms, hypogonadism, sexual dysfunction, osteoporosis, fibrocystic breast disease, PCOS screening, anovulation, menopausal symptoms. Ideal for monitoring HRT dosing.

Consider for Men:

Monitor for estrogen dominance, hypogonadism, andropause, fatigue, low libido, ED, osteoporosis screening.

Comprehensive Female Profiles

These profiles include both saliva and DBS tests, and provide a broad assessment of possible hormonal imbalances because they assess sex, adrenal, and thyroid hormone levels. These three hormone systems work in harmony, and an imbalance in one system affects the balance of the others as well. Comprehensive testing allows the health care provider to determine appropriate treatment to restore balance and achieve overall wellness.

- ✓ **Comprehensive Female Profile I includes:**
Saliva: E2, Pg, T, DS, Cx4
Blood Spot: TSH, fT3, fT4, TPOab
- ✓ **Comprehensive Female Profile II includes:**
Saliva: Cx4
Blood Spot: E2, total; Pg; T, total; SHBG; DS; TSH; fT3; fT4; TPOab

Comprehensive Female Profile I combines ZRT's popular Salivary Hormone Profile III with our Essential Thyroid Profile tests in DBS.

Comprehensive Female Profile II tests only the diurnal cortisol in saliva, while the sex and thyroid hormones are all tested in DBS. Allows physicians to assess baseline levels before HRT; ideal for monitoring HRT dosing. Full assessment of thyroid health, including screening for hypo or hyperthyroidism, determining Free T4 levels as well as Free T3 levels, testing for autoimmune thyroid disease, and monitoring thyroid replacement dosage.

Consider for:

Amenorrhea, PMS, DUB, estrogen dominance symptoms, hypogonadism, sexual dysfunction, osteoporosis, fibrocystic breast disease, infertility screening, PCOS screening, anovulation, menopausal symptoms, screening for adrenal dysfunction, and thyroid dysfunction.

Comprehensive Male Profiles

These profiles include both saliva and DBS tests, and provide a broad assessment of possible hormonal imbalances because they assess sex, adrenal, and thyroid hormone levels. These three hormone systems work in harmony, and an imbalance in one system affects the balance of the others as well. Comprehensive testing allows the health care provider to determine appropriate treatment to restore balance and achieve overall wellness.

- ✓ **Comprehensive Male Profile I includes:**
Saliva: E2, T, DS, Cx4
Blood Spot: PSA, TSH, fT3, fT4, TPOab
- ✓ **Comprehensive Male Profile II includes:**
Saliva: Cx4
Blood Spot: E2, total; T, total; SHBG; DS; PSA; TSH; fT3; fT4; TPOab

Comprehensive Male Profile I combines a male version of ZRT's popular Salivary Hormone Profile III with our Essential Thyroid Profile in DBS. For men, PSA is included instead of the less relevant (for men) salivary progesterone.

Comprehensive Male Profile II tests only the diurnal cortisol in saliva, while the sex and thyroid hormones are all tested in DBS. Allows physicians to monitor for estrogen dominance, hypogonadism, andropause; full assessment of thyroid health, including screening for hypo or hyperthyroidism, determining Free T4 levels as well as Free T3 levels, testing for autoimmune thyroid disease, and monitoring thyroid replacement dosages.

Consider for:

Fatigue, sleep disturbance, decreased cognition, depression, low libido, ED, infertility, loss of bone and muscle mass, weight gain, adrenal and thyroid dysfunction.

- ▶ *Don't need PSA? Select one of the female profiles instead.*

Female Serum Hormones – Basic & Advanced Profiles

Serum testing of sex hormones can be used to determine circulating endogenous hormone levels in women who are not using topical or vaginal hormone supplementation (see our DBS or saliva testing options for women using hormone therapy). Basic profiles are a good start for testing proper balance of sex hormones, adrenal hormones, and TSH. Advanced profiles provide a broader overview of the health and balance of sex and thyroid hormones, and they include pituitary hormones that control ovarian production of the sex hormones and help define menopausal status. Iron status, important for thyroid health, is assessed with ferritin measurement.

- ✓ **Female Serum Hormones Basic Profile includes:**
E2, Pg, T, SHBG, DS, C, TSH
- ✓ **Female Serum Hormones Advanced Profile includes:**
E2, Pg, T, SHBG, DS, C, TSH, fT3, fT4, TPOab, FSH, LH, FER

Consider for:

Amenorrhea, PMS, DUB, estrogen dominance symptoms, hypogonadism, sexual dysfunction, osteoporosis, fibrocystic breast disease, infertility screening, PCOS screening, anovulation, menopausal symptoms, adrenal and thyroid dysfunction.

Male Serum Hormones – Basic & Advanced Profiles

Serum testing of sex hormones can be used to determine circulating endogenous hormone levels in men who are not using topical hormone supplementation (see our DBS or saliva testing options for men using hormone therapy). Basic profiles are a good start for testing proper balance of sex hormones, adrenal hormones, and TSH. The advanced profile provides a broader overview of the health and balance of sex and thyroid hormones, and include LH which, if low, can indicate excessive testosterone supplementation. Iron status, important for thyroid health, is assessed with ferritin measurement. PSA and prolactin are included as a prescreen for testosterone therapy to exclude prostate issues and pituitary prolactinoma.

- ✓ **Male Serum Hormones Basic Profile includes:**
E2, T, PSA, SHBG, DS, C, TSH
- ✓ **Male Serum Hormones Advanced Profile includes:**
E2, T, PSA, SHBG, DS, C, TSH, fT3, fT4, TPOab, LH, PRL, FER

Fertility Profile

The profile provides a thorough evaluation that can identify many problems related to hormone imbalances that are associated with infertility. DBS samples are collected on days three and 21 of the menstrual cycle, and saliva samples are collected only on day 21. LH and FSH are tested on day three, while on day 21 estradiol, progesterone, testosterone, DHEA-S, SHBG, and the thyroid hormones are tested in DBS and diurnal cortisol is tested in saliva.

- ✓ **Fertility Profile includes:**
Saliva: Cx4
Blood Spot: E2, total; Pg; T, total; SHBG; DS; TSH; fT3; fT4; TPOab; FSH; LH

Consider for:

Fatigue, sleep disturbance, decreased cognition, depression, low libido, ED, infertility, loss of bone and muscle mass, weight gain, adrenal and thyroid dysfunction.

Fertility Profile meets the requirement for initial screening for fertility assessment by reproductive endocrinologists.

Assessment of ovarian reserve as well as screening for multiple common reasons for infertility including: anovulation, PCOS, hypothyroidism, premature ovarian failure or ovarian insufficiency.

Consider for:

Women who have been trying to get pregnant without success, or who would like to be proactive in their preconception planning by getting a baseline screening.

Menstrual Cycle Mapping

This profile offers an assessment of sex hormone and LH patterns throughout a menstrual cycle to help health care practitioners get to the root of hormone-related menstrual symptoms, irregular cycles, amenorrhea, or infertility. Dried urine testing provides a simple and convenient way to assess fluctuations in daily hormone levels over an entire month, known as menstrual cycle mapping.

- ✓ **Menstrual Cycle Mapping includes:**
Dried Urine: E1G, PDG, LH, Crtn

Consider for:

Consider for women with irregular cycles, cyclic hormone-related symptoms such as PMS or headaches, infertility, or luteal phase defects to identify hormone imbalances that may be contributing to their symptoms

LCMS Saliva Steroid Profile

The profile includes 23 tests all reported together from one convenient morning saliva collection. Tests include a broad range of bioavailable estrogens, androgens, progestogens and corticosteroids and their metabolites; plus melatonin, ethinyl estradiol and the hormone blockers anastrozole, finasteride and letrozole. This provides a comprehensive picture of hormonal status and how hormonal birth control and hormone blockers are affecting endogenous hormone availability.

- ✓ **LCMS Saliva Steroid Profile Includes:**
E2, E3, E1, EE, PregS, Pg, AlloP, 17OHPg, Adione, T, DHT, D, DS, 7keto, 11DC, C, Cn, Ccn, Ald, Mel, ANZ, FIN, LTZ

Consider for Women:

Hair loss, acne, PCOS, topical DHEA or 7-keto DHEA supplementation, hormonal birth control users, adrenal dysfunction, or those treated with hormone blockers for breast cancer.

Consider for Men:

Hypogonadism, andropause, BPH, adrenal dysfunction, monitoring hormone supplementation.

Urine Hormone Metabolites Profiles

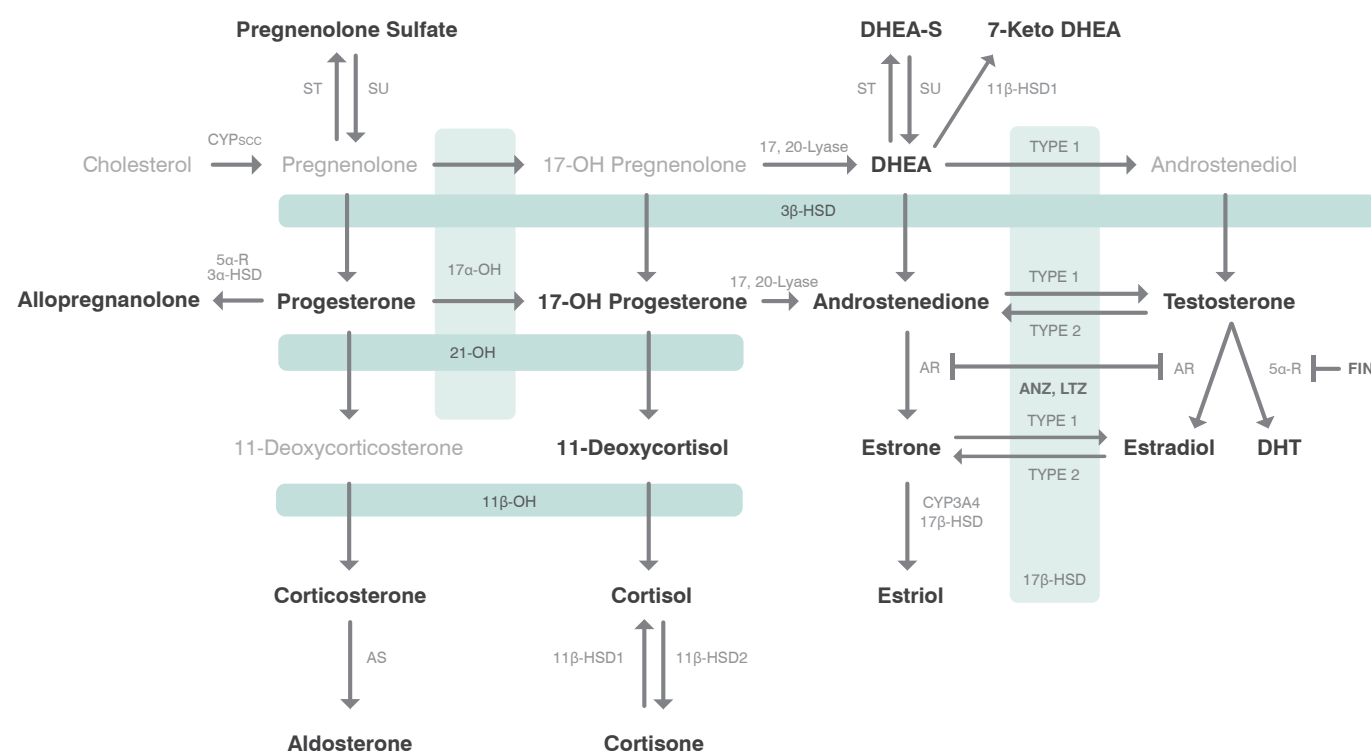
Urinary hormone metabolites testing provides a unique diagnostic view that no other hormone testing offers. Because it assesses both parent hormones and their corresponding metabolites, it reveals how the body is breaking down key hormones like estrogens, progestogens, androgens, cortisol and melatonin. This testing gives insight into whether we are fully detoxifying our hormones, which is important because some hormones can be carcinogenic if they don't break down properly – leaving us more at risk for a variety of diseases, like cancer.

They include:

- ▶ A wide array of estrogen, progesterone, and androgen metabolites useful for assessment of breast cancer risk
- ▶ Glucocorticoid metabolites, diurnal free cortisol, and diurnal free cortisone for adrenal assessment
- ▶ Diurnal 6-sulfatoxymelatonin (MT6s) to assess sleep/wake cycle dysfunction
- ▶ The xenoestrogen bisphenol A (BPA)

Sex steroid hormone metabolites results are useful for monitoring hormone therapy patients using patches, pellets or injectables.

Saliva Steroid Cascade



Abbreviation Key

AR - Aromatase
AS - Aldosterone Synthase
ST - Sulfotransferase
SU - Sulfatase

Steroid Synthesis Inhibitors

ANZ - Anastrozole
FIN - Finasteride
LTZ - Letrozole

Also Tested By ZRT

Ethinyl Estradiol
Melatonin

Analytes in bold are reported by ZRT

✓ Adrenal Profile

A picture of adrenal hormone metabolism.

Consider for patients with adrenal dysfunction or stress. Useful as a second step of testing for those with adrenal fatigue symptoms, but whose saliva cortisol levels are normal (*i.e.*, may indicate hyperexcretion of cortisol/excessive conversion to cortisone). Useful as a screening test for Addison's or Cushing's disease.

✓ Estrogen Essential Profile

A baseline view of how a patient is metabolizing estrogens.

Consider for anyone with a personal or family history of estrogen-dependent cancer (*e.g.*, breast cancer).

✓ Estrogen Elite Profile

Estrogen, progesterone, and select androgen metabolites with BPA.

Consider for anyone with a personal or family history of estrogen-dependent cancer (*e.g.*, breast cancer), patients with symptoms of estrogen/progesterone imbalance, men with prostate cancer risk, or patients who want to assess their exposure to BPA.

✓ Basic Profile

A baseline view of sex steroid hormone metabolite levels plus total cortisol.

Consider as a baseline assessment for HRT.

✓ Advanced Profile

Our broadest view of sex steroid hormone metabolite levels and cortisol metabolism, with full diurnal melatonin and BPA.

Consider as a comprehensive assessment for patients at risk of breast cancer, patients with symptoms of estrogen/progesterone imbalance, men with prostate problems, and patients who want to assess exposure to BPA. Also beneficial for patients struggling with weight or insulin resistance, who have signs of adrenal dysfunction, or who have sleep problems affecting health.

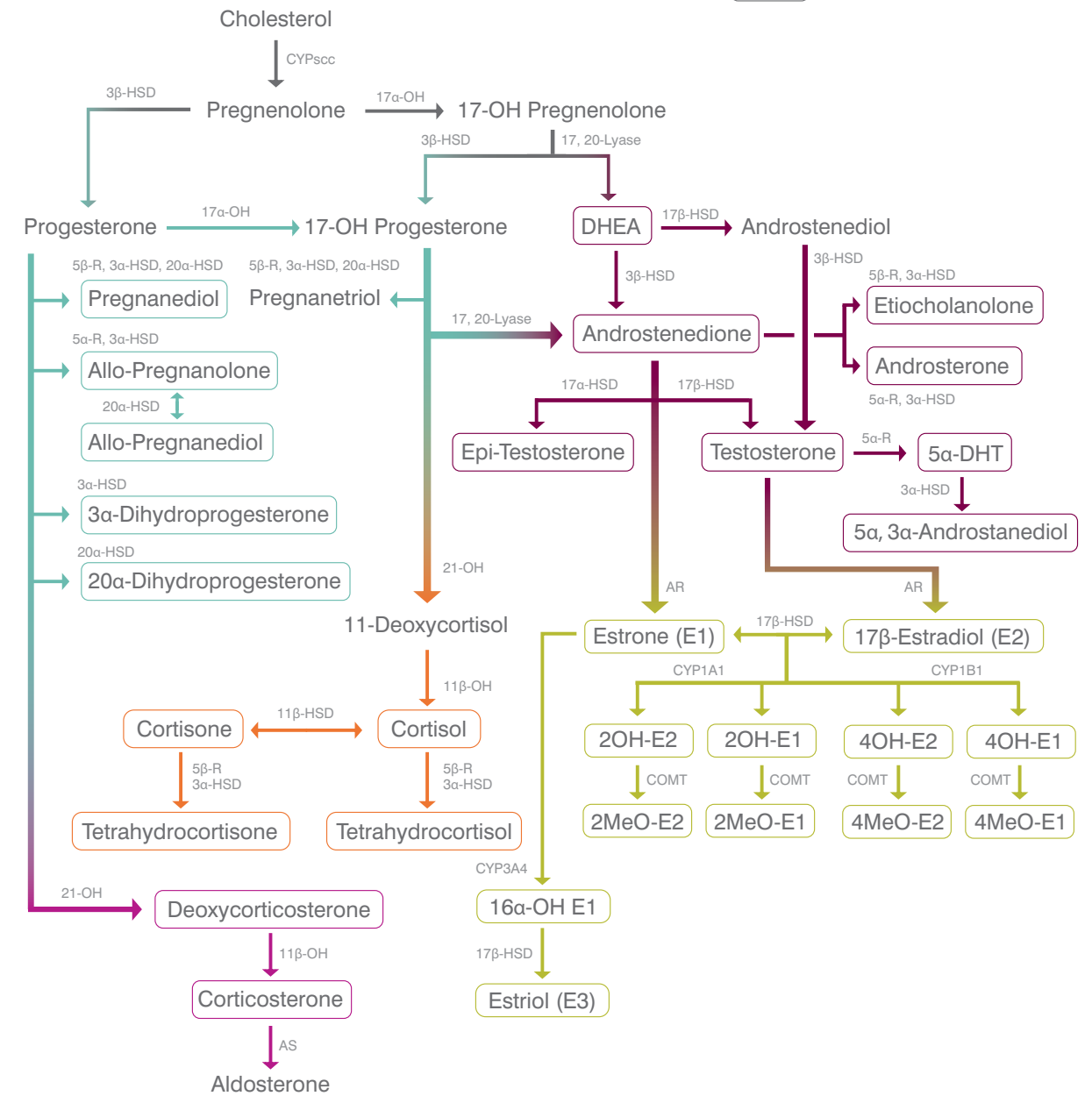
Urine Hormone Metabolites Profiles

Urine Metabolites Profile Options	Adrenal	Estrogen Essential	Estrogen Elite	Basic	Advanced
ESTROGENS					
Estradiol (E2)		•	•	•	•
Estrone (E1)		•	•	•	•
Estriol (E3)		•	•	•	•
2-Hydroxy Estradiol (2-OH E2)		•	•		•
2-Hydroxy Estrone (2-OH E1)		•	•		•
4-Hydroxy Estradiol (4-OH E2)		•	•		•
4-Hydroxy Estrone (4-OH E1)		•	•		•
16α-Hydroxy Estrone (16α-OH E1)		•	•		•
2-Methoxy Estradiol (2-MeO E2)		•	•		•
2-Methoxy Estrone (2-MeO E1)		•	•		•
4-Methoxy Estradiol (4-MeO E2)		•	•		•
4-Methoxy Estrone (4-MeO E1)		•	•		•
Bisphenol A (BPA)			•		•
PROGESTOGENS					
Pregnanediol (Pgdiol)			•	•	•
Allopregnanolone (AlloP)			•	•	•
Allopregnanediol (AlloPd)					•
3α-Dihydroprogesterone (3αHP)					•
20α-Dihydroprogesterone (20αHP)					•
Deoxycorticosterone (DOC)					•
Corticosterone (Ccn)					•
ANDROGENS					
DHEA (D)	•		•	•	•
Androstenedione (Adione)			•	•	•
Androsterone (Andro)					•
Etiocholanolone (Etio)					•
Testosterone (T)			•	•	•
Epi-Testosterone (Epi-T)			•	•	•
5α-Dihydrotestosterone (5α-DHT)			•	•	•
5α,3α-Androstanediol (5α3α)					•
GLUCOCORTICOIDS					
Total Cortisol (TC)	•			•	•
Free Cortisol x4 (FC x4)	•				•
Total Cortisone (TCn)	•				•
Free Cortisone x4 (FCn x4)	•				•
Tetrahydrocortisol (ThC)	•				•
Tetrahydrocortisone (ThCn)	•				•
Melatonin x4 (MT6s x4)					•

Abbreviations in parentheses as they appear on test requisitions and test reports

Steroid Hormone Cascade

Boxed metabolites are reported by ZRT.



Enzyme Abbreviations

- Androgens
 - Estrogens
 - Glucocorticoids
 - Mineralocorticoids
 - Progestogens
- (5α-R) 5α-Reductase
 (5β-R) 5β-Reductase
 (11β-OH) 11β-Hydroxylase
 (17α-OH) 17α-Hydroxylase
 17,20-Lyase (same enzyme as 17α-OH)
 (21-OH) 21-Hydroxylase
 (3α-HSD) 3α-Hydroxysteroid dehydrogenase
 (3β-HSD) 3β-Hydroxysteroid dehydrogenase
- (11β-HSD) 11β-Hydroxysteroid dehydrogenase
 (17α-HSD) 17α-Hydroxysteroid dehydrogenase
 (17β-HSD) 17β-Hydroxysteroid dehydrogenase
 (20α-HSD) 20α-Hydroxysteroid dehydrogenase
 (AR) Aromatase
 (AS) Aldosterone Synthase
 (CYP) Cytochrome p450 (sc, 1A1, 1B1 & 3A4)
 (COMT) Catechol-O-Methyl-Transferase



Diurnal Cortisol Profile

The full diurnal cortisol profile at four time points during the day.

- ✓ **Diurnal Cortisol Profile includes:**
Saliva: Cx4

Consider for:

Stress, immune dysfunction, chronic fatigue, and/or multiple symptoms of adrenal imbalance.

Adrenal Stress Profile

The profile tests the adrenal hormones DHEA-S and diurnal cortisol. When individuals experience continuous stress, not only from emotional stressors (e.g., marital, financial, and occupational) but also from physical stressors (e.g., sleep deprivation, caffeine consumption, pain, extreme exercise), it can lead to changes in adrenal hormone levels, related to disorders ranging from anxiety to infertility.

- ✓ **Adrenal Stress Profile includes:**
Saliva: DS, Cx4

Consider for:

Individuals under stress with multiple symptoms of adrenal imbalance, including immune dysfunction, fatigue, allergies, and sleep disturbances.

Cortisol Awakening Response

The Cortisol Awakening Response – also called CAR – reveals more detailed clues that help in assessing adrenal hormone/HPA axis dysfunction. Six cortisol collections in 24 hours is the most common method for assessing CAR. Start saliva collection within five minutes of waking for the day, followed by a second sample at 30 minutes, and a third sample at 60 minutes. The rest of the diurnal rhythm can be assessed at the normal time intervals – noon, evening and night.

- ✓ **Cortisol Awakening Response Profile includes:**
Saliva: DS, Cx6

Consider for:

PTSD, major depression, chronic fatigue syndrome and other severe stress conditions.

Essential & Elite Thyroid Profiles

Thyroid dysfunction can explain a wide variety of symptoms because of the central role of thyroid hormones in directing the metabolic activity of cells. A properly regulated thyroid is essential to a wide array of biochemical processes in the body. These profiles can help detect both overt and subclinical thyroid disease, as well as monitor thyroid replacement therapy.

- ✓ **Available in Dried Blood Spot**
- ✓ **Essential Thyroid Profile includes:** TSH, fT3, fT4, TP0ab
- ✓ **Elite Thyroid Profile includes:** T4, Tgbn, TSH, fT3, fT4, TP0ab

Essential Thyroid Profile provides assessment of thyroid health, including screening for hypo- or hyperthyroidism, determining Free T4 and Free T3 levels, testing for autoimmune thyroid disease, and monitoring thyroid replacement dosages.

Elite Thyroid Profile adds an indicator of low iodine status and total T4 production by the thyroid gland.

Consider for:

Alopecia, anxiety, arthralgias, constipation, depression, fatigue, Hashimoto's disease, hyperlipidemia, hypertension, infertility, menstrual disorders (DUB, amenorrhea), mood disorders, obesity, sleep disorders, and weight issues.

Comprehensive Thyroid Profile

This profile combines ZRT's innovative Toxic & Essential Elements - Urine Profile with thyroid testing in DBS for a more comprehensive thyroid assessment.

- ✓ **Comprehensive Thyroid Profile includes:**
Dried Urine: Iodine, Selenium, Bromine, Lithium, Arsenic, Cadmium, Mercury
Blood Spot: T4, Tgbn, TSH, fT3, fT4, TP0ab

Comprehensive Thyroid Profile allows doctors to see if an individual has too little, or too much, iodine and selenium, and/or exposure to the iodine/selenium antagonists bromine, arsenic, and mercury; full assessment of thyroid health, including screening for hypo or hyperthyroidism, determines Free T4 and Free T3 levels, testing for autoimmune thyroid disease, and monitoring thyroid replacement dosages.

Consider for:

Patients with thyroid dysfunction coupled with concerns about toxic element exposure and iodine/selenium deficiency's impact on T4 to T3 conversion.

Comprehensive Female Profiles

These profiles include both saliva and DBS tests, and provide a broad assessment of possible hormonal imbalances because they assess sex, adrenal, and thyroid hormone levels. These three hormone systems work in harmony, and an imbalance in one system affects the balance of the others as well. Comprehensive testing allows the health care provider to determine appropriate treatment to restore balance and achieve overall wellness.

- ✓ **Comprehensive Female Profile I includes:**
Saliva: E2, Pg, T, DS, Cx4
Blood Spot: TSH, fT3, fT4, TPOab
- ✓ **Comprehensive Female Profile II includes:**
Saliva: Cx4
Blood Spot: E2, total; Pg; T, total; SHBG; DS; TSH; fT3; fT4; TPOab

Comprehensive Male Profiles

These profiles include both saliva and DBS tests, and provide a broad assessment of possible hormonal imbalances because they assess sex, adrenal, and thyroid hormone levels. These three hormone systems work in harmony, and an imbalance in one system affects the balance of the others as well. Comprehensive testing allows the health care provider to determine appropriate treatment to restore balance and achieve overall wellness.

- ✓ **Comprehensive Male Profile I includes:**
Saliva: E2, T, DS, Cx4
Blood Spot: PSA, TSH, fT3, fT4, TPOab
- ✓ **Comprehensive Male Profile II includes:**
Saliva: Cx4
Blood Spot: E2, total; T, total; SHBG; DS; PSA; TSH; fT3; fT4; TPOab

Comprehensive Female Profile I combines ZRT's popular Salivary Hormone Profile III with our Essential Thyroid Profile tests in DBS.

Comprehensive Female Profile II tests only the diurnal cortisol in saliva, while the sex and thyroid hormones are all tested in DBS. Allows physicians to assess baseline levels before HRT; ideal for monitoring HRT dosing. Full assessment of thyroid health, including screening for hypo or hyperthyroidism, determining Free T4 levels as well as Free T3 levels, testing for autoimmune thyroid disease, and monitoring thyroid replacement dosage.

Consider for:

Amenorrhea, PMS, DUB, estrogen dominance symptoms, hypogonadism, sexual dysfunction, osteoporosis, fibrocystic breast disease, infertility screening, PCOS screening, anovulation, menopausal symptoms, screening for adrenal fatigue, and thyroid dysfunction.

Comprehensive Male Profile I combines a male version of ZRT's popular Salivary Hormone Profile III with our Essential Thyroid Profile in DBS. For men, PSA is included instead of the less relevant (for men) salivary progesterone.

Comprehensive Male Profile II tests only the diurnal cortisol in saliva, while the sex and thyroid hormones are all tested in DBS. Allows physicians to monitor for estrogen dominance, hypogonadism, andropause; full assessment of thyroid health, including screening for hypo or hyperthyroidism, determining Free T4 levels as well as Free T3 levels, testing for autoimmune thyroid disease, and monitoring thyroid replacement dosages.

Consider for:

Fatigue, sleep disturbance, decreased cognition, depression, low libido, ED, infertility, loss of bone and muscle mass, weight gain, adrenal and thyroid dysfunction.

- ▶ *Don't need PSA? Select one of the female profiles instead.*

Iodine Panel in Dried Urine

Iodine deficiency can reduce thyroid hormone synthesis leading to hypothyroidism. Conversely, too much iodine consumption can also cause thyroid problems. Iodine testing allows for determination of iodine status based on CDC and WHO guidelines for thyroid as well as extra-thyroidal sufficiency.

- ✓ **Iodine Panel includes:**
Dried Urine: Iodine

Toxic & Essential Elements - Urine

Iodine is an essential component of T3 and T4, so its deficiency has a serious impact on thyroid hormone synthesis, while selenium is a component of the selenoproteins, including the deiodinases that convert inactive T4 to active T3, and glutathione peroxidase, an important antioxidant. Arsenic and mercury reduce selenium's bioavailability and disrupt thyroid health. Arsenic, mercury, and cadmium represent three of the four most toxic heavy metals according to the CDC. Lithium is important for brain health in trace amounts but is toxic when used in excessive amounts pharmacologically.

- ✓ **Toxic & Essential Elements - Urine includes:**
Iodine, Selenium, Bromine, Lithium, Arsenic, Cadmium, Mercury

Toxic & Essential Elements - Blood

Essential elements are only conducive to optimal health when they are within optimal ranges – levels that are too low or too high can have detrimental effects on health – and exposure to toxic heavy metals has multiple adverse health effects. DBS testing represents red blood cell levels of the nutritional elements magnesium, zinc, and copper, revealing deficiencies earlier than a typical serum test.

- ✓ **Toxic & Essential Elements - Blood includes:**
Mercury, Cadmium, Zinc, Copper, Selenium, Magnesium

Iodine Panel Allows physicians to see if an individual has too little, or too much, of the essential nutrient iodine.

Consider for:

Patients with thyroid issues.

- ▶ *Creatinine is measured in all samples to correct results for urine dilution.*

Toxic & Essential Elements - Urine Allows physicians to see if an individual has too little, or too much, of the essential nutrients iodine and selenium or the trace elements bromine and lithium, or if they have been exposed to too much of the toxic elements arsenic, mercury, and cadmium.

Consider for:

Smokers, patients at risk of exposure to toxic heavy metals, or patients with thyroid issues and/or possible disruption of T4 to T3 conversion due to excesses or deficiencies of the elements tested.

- ▶ *Creatinine is measured in all samples to correct results for urine dilution.*

Toxic & Essential Elements - Blood Profile

assesses an individual's levels of the essential nutrients zinc, copper, selenium, and magnesium, and their exposure to the toxic heavy metals mercury and cadmium.

Consider for:

Smokers; patients with exposure to toxic heavy metals through hobbies, work, or dentistry; people who live or have lived in older homes or areas where metals may be present in drinking water; and patients whose health issues could be a result of nutritional deficiencies or imbalances in essential elements.



Comprehensive Toxic & Essential Elements

We are all exposed to different amounts of essential and toxic elements depending on where we live, our diet and supplementation routine, and environmental pollution of the air we breathe. Essential elements are only conducive to optimal health when they are within optimal ranges – levels that are too low or too high can have detrimental effects on health – and exposure to toxic heavy metals has multiple adverse health effects. The comprehensive profile allows a complete assessment of the most important elements implicated in health-related effects, as it includes a measure of both short- and long- term exposure to all four of the most toxic environmental heavy metals, as well as highlighting nutritional element deficiencies earlier than a typical serum test.

✓ Comprehensive Toxic & Essential Elements Profile includes:

Dried Urine: Iodine, Selenium, Bromine, Lithium, Arsenic, Cadmium, Mercury
 Blood Spot: Mercury, Cadmium, Zinc, Copper, Selenium, Magnesium

Comprehensive Toxic & Essential Elements Profile

assesses an individual's levels of the essential nutrients iodine, selenium, zinc, copper, magnesium, lithium, and bromine, and their exposure to the toxic elements arsenic, cadmium, and mercury.

Consider for:

Smokers; patients with exposure to toxic heavy metals through hobbies, work, or dentistry; people who live or have lived in older homes or areas where metals may be present in drinking water; and patients whose health issues could be a result of nutritional deficiencies or imbalances in essential elements.

► *Creatinine is measured in all samples to correct results for urine dilution.*

NeuroAdvanced Profile

The neurotransmitter test provides a framework for understanding the connection of our body's physical health to our brain's well-being. In a nutshell, it is an effective advanced screening tool designed to gather information about the levels of specific neurotransmitters, amino acid precursors, and metabolites originating in various organs throughout the body. These molecules convey messages to the brain either directly by crossing the blood-brain barrier, indirectly via the nerves of the enteric nervous system, or the vagus nerve itself. The levels of these molecules, determined by the neurotransmitter test (too low, too high, or just right, *i.e.*, within range), are as individual as each individual patient, reflective of that person's own ecosystem (genes + lifestyle + environment).

Discovering the detailed interplay between neurotransmitters and perhaps other endocrine signaling molecules, has helped fortify our understanding of how biological function in the body influences brain health. The results of the test provide a biochemical basis that helps explain mental health-related symptoms the patient is suffering from and enable the practitioner to move forward with creating a highly individualized therapeutic intervention, usually based on a combination of lifestyle and dietary changes that include personalized nutritional intervention strategies (*e.g.*, methylation support, antioxidants, targeted amino acids, vitamins + minerals, adaptogens, etc.).

This test is a great example of how complementary medicine tackles the notion of "chemical imbalance" from something hypothetical, subjective, and rather elusive; to quantifiable, objective and, more importantly, therapeutically actionable.

✓ NeuroAdvanced Profile Includes:

GABA, Glu, Gly, DA, Epi, NE, HIST, 5-HT, PEA, DOPAC, HVA, 5-HIAA, NMN, VMA Trp, Kyn, 3-OHkyn, Tau, Gln, His, N-MeHist, Tyra, KynAc, Xanth, Tyr, Crtn

Consider for:

Testing neurotransmitters in patients with a suspected neurochemical imbalance can help assess individual biochemistry and get to the root of persistent issues such as:

- Mood/affective disorders
- Adrenal dysfunction
- Addictive behaviors
- Sleep problems
- ADD/ADHD or OCD
- PMS/PMDD

► *Creatinine is measured in all samples to correct results for urine dilution.*

+ Add-On Options

- **Saliva Hormones**
E2, Pg, T, DS, C
- **Urine Hormones**
E2, Pregnanediol, Allopregnanolone, Androstenedione, T, Epi-T, DHT, DHEA, 5 α ,3 α -Androstenediol
- **Diurnal Cortisol**
Dried Urine: Free Cortisol x4, Free Cortisone x4
- **Diurnal Cortisol & Melatonin**
Dried Urine: Free Cortisol x4, Free Cortisone x4, Melatonin (MT6s) x4
- **Diurnal Cortisol, Norepinephrine & Epinephrine**
Dried Urine: Free Cortisol x4, Free Cortisone x4, NE x4, Epi x4
- **Diurnal Cortisol, Melatonin, Norepinephrine & Epinephrine**
Dried Urine: Free Cortisol x4, Free Cortisone x4, Melatonin (MT6s) x4, NE x4, Epi x4
- **Urine Toxic & Essential Elements**
Iodine, Selenium, Bromine, Lithium, Arsenic, Cadmium, Mercury

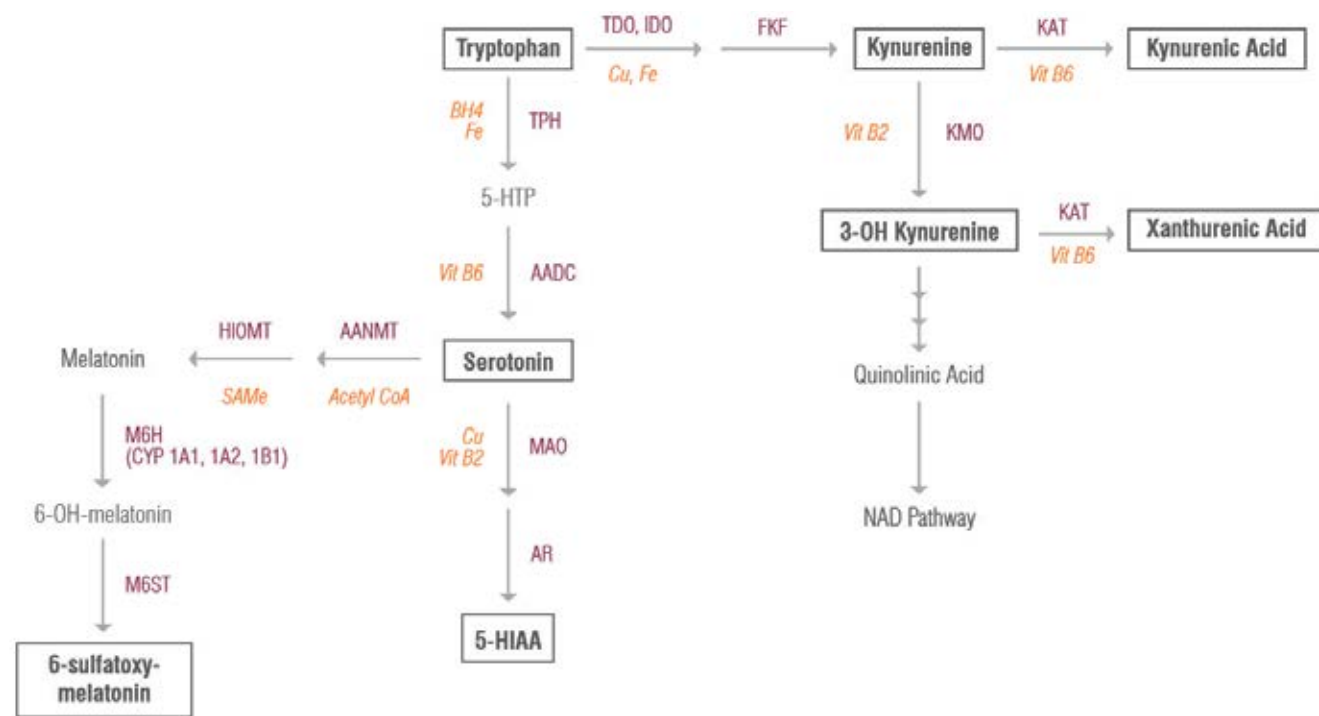
Why Test Neurotransmitters with Toxic & Essential Elements?

Heavy metals are damaging to brain health. They disrupt neurotransmitter function and create oxidative stress that is detrimental to nerve cells, contributing to mood disorders, poor memory and dementia. Identifying exposure to heavy metals may be key to assessing and treating mood disorders and preventing neurodegenerative diseases.

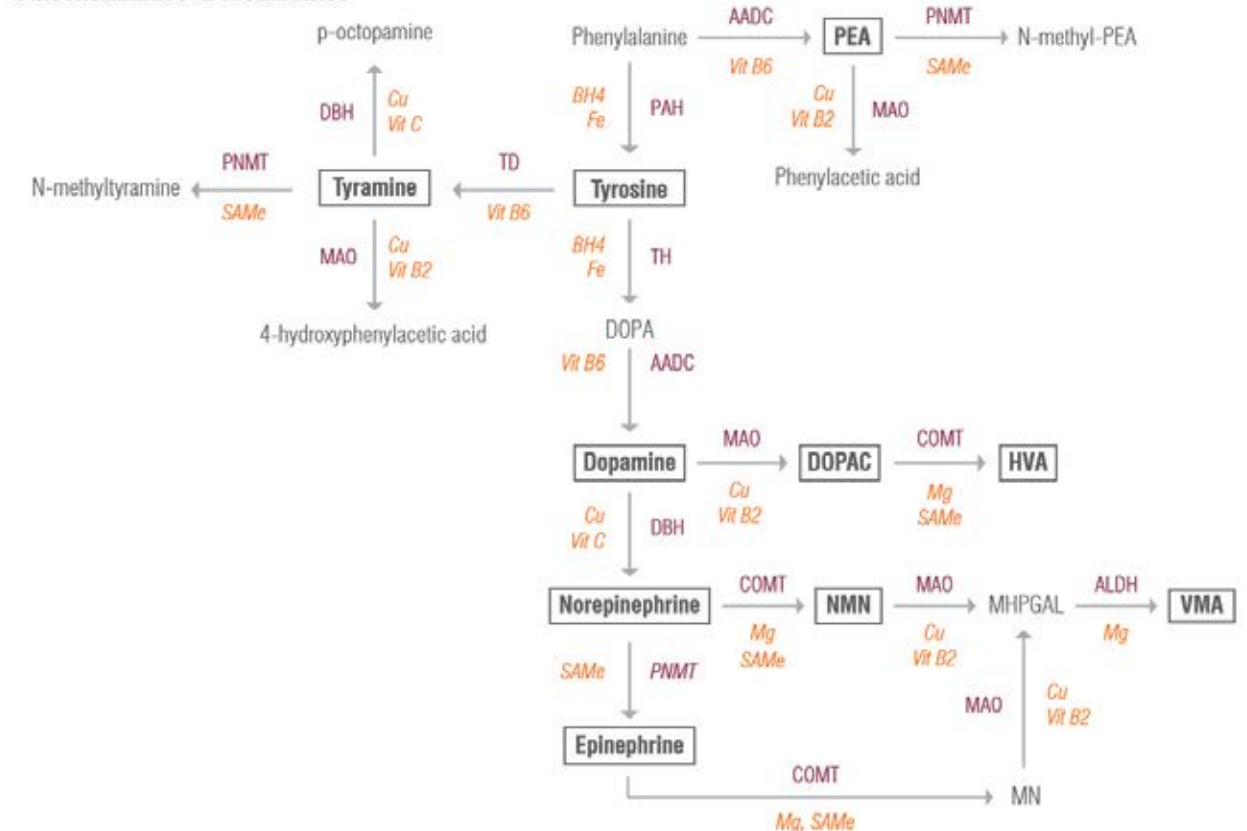
To learn more, visit www.zrtlab.com/test-specialties/neurotransmitters/



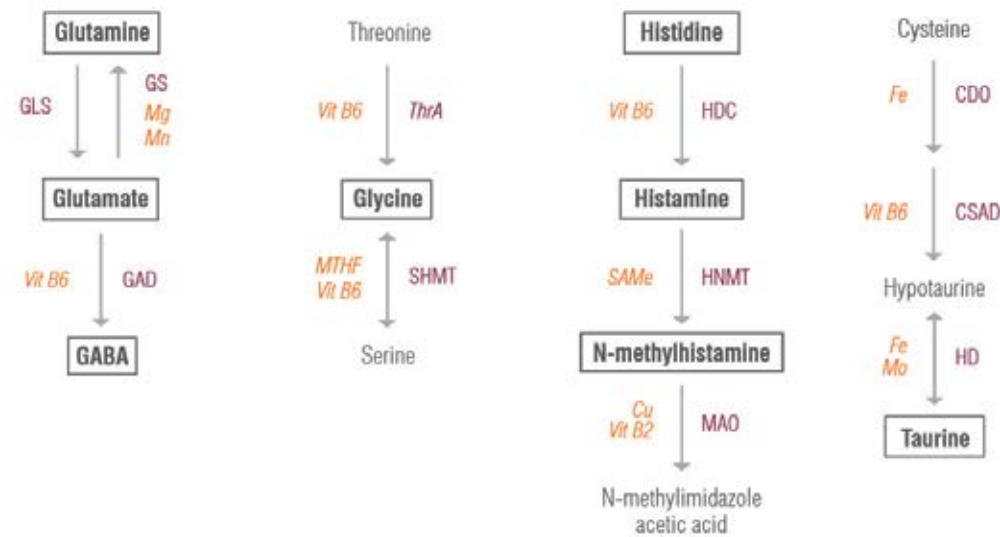
Neurotransmitter Cascades



Catecholamines & Metabolites



Glutamate/GABA, Glycine, Histamine & Taurine



Abbreviations & Key

Neurotransmitters & Metabolites:	HVA	homovanillic acid	CSAD	cysteinesulfinic acid decarboxylase
	NMN	normetanephrine	DBH	dopamine beta hydroxylase
	PEA	phenethylamine	FKF	N-Formyl kynurenine formamidase
	VMA	vanillylmandelic acid	GAD	glutamate decarboxylase
	5-HIAA	5-hydroxyindole 3-acetic acid	GLS	glutaminase
Cofactors:	BH4	tetrahydrobiopterin	GS	glutamine synthetase
	Cu	copper	HD	hypotaurine dehydrogenase
	Fe	iron	HDC	histidine decarboxylase
	Mg	magnesium	HIOMT	hydroxyindole-O-methyltransferase
	Mn	manganese	HNMT	histamine N-methyltransferase
	Mo	molybdenum	IDO	indoleamine 2,3-dioxygenase
	MTHF	methyltetrahydrofolate	KAT	kynurenine aminotransferase
	SAMe	S-adenosyl methionine	KMO	kynurenine hydroxylase/monooxygenase
Enzymes:	AADC	aromatic L-amino acid decarboxylase	MAO	monoamine oxidase
	AANMT	arylalkylamine N-methyltransferase	M6H	melatonin 6 hydroxylase
	ALDH	aldehyde dehydrogenase	M6ST	melatonin 6 sulfotransferase
	AR	aldehyde reductase	PAH	phenylalanine hydroxylase
	CDO	cysteine dioxygenase	PNMT	phenylethanolamine N-methyltransferase
	COMT	catechol-O-methyltransferase	SHMT	serine hydroxymethyltransferase
			TD	tyrosine decarboxylase
			TDO	tryptophan 2,3-dioxygenase
			TH	tyrosine hydroxylase
			ThrA	threonine aldolase
			TPH	tryptophan hydroxylase

Weight Management

The Weight Management Profile identifies hormonal imbalances that contribute to obesity, weight gain, and difficulty losing or sustaining a healthy weight. Used as a screening tool, it serves as an early indicator of insulin resistance and risks for metabolic syndrome and diabetes.

- ✓ **Weight Management Profile includes:**
Saliva: E2, Pg, T, DS, Cx4
Blood Spot: TSH, Vitamin D2/D3, Insulin, HbA1c

Weight Management Profile allows physicians to isolate specific imbalances of one or more hormones that contribute to weight gain, slowed metabolism, increased body fat deposition, and food/sugar cravings. Facilitates correction of imbalances for weight control, and risks for cardiometabolic disease and diabetes.

Consider for Women:

With premenstrual weight gain and fluid retention; perimenopausal and/or menopausal weight gain in hips/thigh, and/or inability to lose/tendency to regain weight, midsection weight gain, PCOS, adrenal and thyroid dysfunction; breast cancer risks.

Consider for Men:

With andropausal weight gain in hips/thighs (female fat distribution pattern) and/or inability to lose/tendency to regain weight, midsection weight gain, adrenal and thyroid dysfunction; prostate cancer risks.

+ Optional Thyroid Add-on:

Free T3, free T4, and TPOab antibodies provide a better estimation of thyroid hormone bioavailability to facilitate effective thyroid therapy.

Consider when:

Symptoms of thyroid deficiency are problematic.

+ Optional Cardio Add-on:

Cardiometabolic risk markers hsCRP, triglycerides, total cholesterol, LDL, HDL and VLDL cholesterol for early detection of pro-inflammatory CVD risks and pre-diabetes.

Consider for:

Abdominal obesity, and symptoms of insulin resistance/metabolic syndrome.

Sleep Balance Profile

ZRT is the only laboratory offering testing for the circadian rhythm of melatonin in concert with cortisol and cortisone to assess sleep/wake cycle dysfunction. Circulating melatonin is efficiently hydroxylated and conjugated with sulfate in the liver to form its primary metabolite, 6-sulfatoxymelatonin (MT6s), and excreted into urine; it is this metabolite that is measured in the Sleep Balance Profile. Adrenal cortisol, produced in response to stress, is also known for its diurnal variation linked to the sleep/wake cycle. It has the opposite pattern to melatonin production in a healthy individual.

- ✓ **Sleep Balance Profile includes:**
Dried Urine: MT6s x4, Free Cortisol x4, Free Cortisone x4

Sleep Balance Profile allows physicians to pinpoint imbalances of melatonin and cortisol circadian rhythms associated with acute or chronic sleep disturbances.

Consider for:

Patients with inability to get to sleep, frequent waking, or chronic sleeplessness affecting vitality, cognition, weight, and diabetes/CVD risks.

+ Optional Norepinephrine & Epinephrine Add-on:

Gives a better picture when there are adrenal issues.

- ▶ *Creatinine is measured in all samples to correct results for urine dilution.*

CardioMetabolic Profile

This profile, entirely in DBS collected after an overnight fast, allows early detection of major indicators associated with metabolic/insulin resistance syndrome. As a screening profile it can facilitate appropriate treatment to reduce type 2 diabetes and CVD risks.

- ✓ **CardioMetabolic Profile includes:**
Blood Spot: Insulin, hsCRP, HbA1c, TG, CH, HDL, LDL, VLDL

Consider for:

Atherosclerosis, CVD, type 2 diabetes, dyslipidemia, hypertension, infertility, insulin resistance, metabolic syndrome, obesity, PCOS, weight issues.

The Wellness Suite

Wherever your patient is are their wellness journey, there is a profile to help them maximize their potential.

Wellness Metrics Profile

This screening profile helps identify specific hormone imbalances associated with menopause/andropause, PCOS, excess weight gain or obesity, vitamin D deficiency, and hypothyroidism. As a risk assessment profile, it allows for early detection of insulin resistance, metabolic syndrome, and type 2 diabetes.

- ✓ **Wellness Metrics Profile includes:**
Saliva: E2, Pg, T, DS, Cx4
Blood Spot: TSH, Vitamin D2/D3, Insulin, HbA1c

Consider for:

Menopause/andropause patients, people interested in a general wellness assessment, PCOS screening.

+ Optional Thyroid Add-on:

Add on thyroid markers fT3, fT4 and TPOab for a more complete thyroid assessment.

+ Optional Cardio Add-on:

Blood lipids TG, CH, HDL, LDL, and VLDL for a more complete cardiovascular risk assessment.

Fitness Metrics Profile

Used when starting out on a fitness journey and during the program, this profile identifies hormone imbalances or vitamin D deficiency that can affect performance or increase injury risk, and monitors progress in improving health fitness by tracking hormonal and blood lipid changes.

- ✓ **Fitness Metrics Profile includes:**
Blood Spot: E2, Pg, T, DS, C, SHBG, TSH, TG, CH, HDL, LDL, VLDL

Consider for:

People pursuing a fitness regimen who want to achieve better hormone balance and cardiometabolic health.

+ Add-on Option:

Add on thyroid markers fT3, fT4 and TPOab for a more complete thyroid assessment; insulin, HbA1c, and hsCRP to detect cardiometabolic risk; and LH for a better picture of endogenous steroid synthesis.

Elite Athlete Metrics Profile

This profile helps identify hormone imbalances or vitamin D deficiency that can affect performance, increase injury risk, or prevent an athlete from competing at their highest level. It is best to start with a baseline before rigorous training begins, and to track hormones throughout a training regimen to look for big changes that can indicate problems and to make sure that hormones are optimally balanced right before a competition.

- ✓ **Elite Athlete Metrics Profile includes:**
Saliva: E2, Pg, T, DS, Cx4
Blood Spot: TSH, fT3, fT4, TPOab, D2/D3

Consider for:

Athletes who want to identify barriers to achieving optimal performance and to prevent injury or overtraining syndrome.

+ Add-on Option:

Add on insulin, HbA1c, hsCRP, and blood lipids TG, CH, HDL, LDL, and VLDL to assess cardiometabolic risk; and LH for a better picture of endogenous steroid synthesis.

Methylation Profile

Nutritional factors involved in methylation pathways (see diagram) are vital to the health of the cardiovascular and nervous systems and to safe steroid hormone metabolism. If these are not at optimal levels, risks for CVD and dementia can increase.

- ✓ **Methylation Profile includes:**
FER, FOL, HCY, B12

Methylation & Memory – Basic & Advanced Profiles

Nutritional factors involved in methylation pathways (see diagram) are vital to the health of the cardiovascular and nervous systems and to safe steroid hormone metabolism. If these are not at optimal levels, risks for CVD and dementia can increase.

- ✓ **Methylation & Memory Basic Profile includes:**
E2, Pg, T, TSH, FOL, HCY, B12
- ✓ **Methylation & Memory Advanced Profile includes:**
E2, Pg, T, SHBG, DS, C, TSH, fT3, fT4, TPOab, FER, FOL, HCY, B12

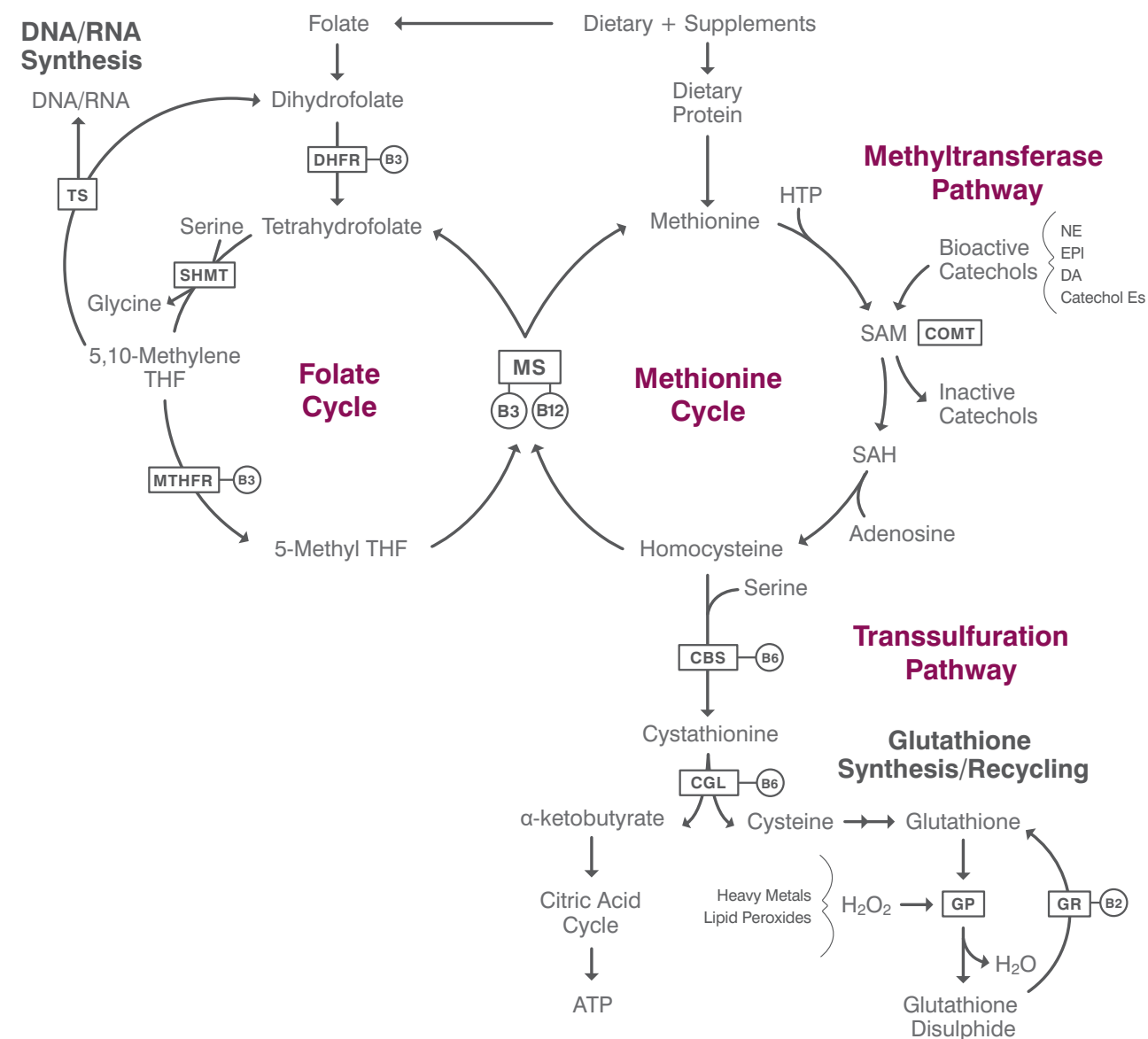
Consider for:

People at risk for deficiencies in nutrients, malabsorption issues, gastrointestinal diseases, people who have had bariatric procedures, people over the age of 40, men and women looking to conceive, people who have a family or personal history of pernicious anemia.

Consider for:

People at risk for deficiencies in nutrients, malabsorption issues, gastrointestinal diseases, people who have had bariatric procedures, people over the age of 40, men and women looking to conceive, people who have a family or personal history of pernicious anemia. People with a family history or increased risk of cognitive decline including Alzheimer's disease.

Methylation Diagram



Abbreviations

- | | |
|-------------------------------------|--|
| (B2) Vitamin B2 – Riboflavin | (Epi) Epinephrine |
| (B3) Vitamin B3 – Niacin | (GR) Glutathione Reductase |
| (B6) Vitamin B6 – Pyridoxine | (GP) Glutathione Peroxidase |
| (B12) Vitamin B12 – Cobalamin | (MS) Methionine Synthase |
| (Catechol Es) Catechol Estrogens | (MTHFR) Methylene tetrahydrofolate Reductase |
| (CBS) Cystathionine Beta-synthase | (NE) Norepinephrine |
| (CGL) Cystathionine Gamma-lyase | (SAH) S-adenosylhomocysteine |
| (COMT) Catechol-o-methyltransferase | (SAM) S-adenosylmethionine |
| (DHFR) Dihydrofolate Reductase | (SHMT) Serine Hydroxymethyltransferase |
| (DA) Dopamine | (TS) Thymidylate Synthase |

Key

- Enzymes
Cofactors



Understanding ZRT's Test Reports

ZRT's test reports are the most comprehensive results available anywhere.

Patient test results are a comprehensive review of their tested levels in correlation with reported symptoms, hormone usage (if applicable) and menstrual history in women. Each test result is individually reviewed to produce a complete report with descriptive comments added by licensed physicians on staff.

TEST REPORT

2018 08 02 200 SB
Ordering Provider: Jane Getuwell, MD

Patient Name: Comprehensive Female Profile II
Patient Phone Number: 555 555 5555

Gender: Female
DOB: 9/30/1964 (53 yrs)

Last Menses: Unspecified
Menses Status: Hysterectomy (ovaries removed)

Height: 5' 8 in
Weight: 154 lb

Waist: Unspecified
BMI: 23.4

8605 SW Creekside Place
Beaverton, OR 97008
Phone: 503-466-2445 Fax: 503-466-1636

ZRT LABORATORY

Samples Received: 08/02/2018
Report Date: 08/08/2018

Samples Collected:
Saliva - 07/28/18 07:30
Saliva - 07/28/18 13:00
Saliva - 07/28/18 19:00
Saliva - 07/28/18 23:00
Blood Spot - 07/31/18 05:45

TEST NAME	RESULTS 07/28/18	03/01/18	02/26/18	RANGE
Salivary Steroids				
Cortisol	6.7	3.2 L		3.7-9.5 ng/mL (morning)
Cortisol	2.3	1.2		1.2-3.0 ng/mL (noon)
Cortisol	0.9	0.7		0.6-1.9 ng/mL (evening)
Cortisol	0.8	1.0		0.4-1.0 ng/mL (night)
Blood Spot Steroids				
Estradiol	69		73	43-180 pg/mL Premeno-luteal or ERT
Progesterone	11.6		31.5 H	3.3-22.5 ng/mL Premeno-luteal or PgRT
Ratio: Pg/E2	168		432	Pg/E2 (bloodspot-optimal 100-500)
Testosterone	97 ⁽¹⁾		34 ⁽²⁾	⁽¹⁾ 20-130 ng/dL Premeno-luteal or TRT ⁽²⁾ 10-45 ng/dL Postmenopausal
SHBG	87			15-120 nmol/L
DHEAS	70			40-290 µg/dL
Blood Spot Thyroids				
Free T4*	1.1			0.7-2.5 ng/dL
Free T3	3.2			2.4-4.2 pg/mL
TSH	0.4 L			0.5-3.0 µU/mL
TPOab*	12			0-150 IU/mL (70-150 borderline)

*L = 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. * For research purposes only.

Results

Results for each test are shown on a color-coded slider.

- Outside the Range
- High/Low Normal
- Within Range

ZRT is one of the few labs able to show historical test results, if available. These results are displayed directly next to the current results, so it's easy to see changes over time.

ZRT reports the normal/expected range of each marker tested.

Note: If applicable, optimal ranges are provided.

Reference ranges are observed ranges based on collected laboratory data. Unlike other labs, patients do not need to stop hormone supplementation to use ZRT's testing because we have ranges adjusted for age, menstrual status, and supplementation types. This is the ideal method for tracking the effectiveness of hormone treatments.

Providers can opt to show all reference ranges for the tests included on a separate page of the report.

TEST REPORT | Results Comprehensive Female Profile II # 2018 08 02 200 SB

Therapies

07/28/2018: 0.5mg topical Biestrogen (E2 + E3) (compounded) (1 Days Last Used)100mg topical Progesterone (compounded) (1 Days Last Used)1000mg oral (Cytone) (OTC) (1 Days Last Used)5mg topical Testosterone (compounded) (1 Days Last Used)5mg sublingual (SL) DHEA (OTC) (1 Days Last Used)50mg oral L-Levothyroxine (14) (Pharmaceutical) (1 Days Last Used)50mg oral Armour (glandular Thyroid) (Pharmaceutical) (1 Days Last Used) oral Tc-33 (Pharmaceutical) (1 Days Last Used) GABA5mg oral Melatonin (OTC) (1 Days Last Used)10mg oral Pregnenolone (OTC) (1 Days Last Used)50mg oral 5-HTP (5-Hydroxytryptophan) (OTC) (1 Days Last Used)

03/01/2018: 0.5mg topical Biestrogen (E2 + E3) (compounded) (23 Hours Last Used)100mg topical Progesterone (compounded) (23 Hours Last Used)

02/26/2018: 0.5mg topical Biestrogen (E2 + E3) (compounded) (1 Days Last Used)100mg topical Progesterone (compounded) (1 Days Last Used)

Graphs

Disclaimer: Graphs below represent averages for healthy individuals not using hormones. Supplementation ranges may be higher. Please see supplementation ranges and lab comments if results are higher or lower than expected.

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Graphs & Therapies

ZRT reports display patient-provided supplementation information (hormone, dose, delivery, timing).

Graphs show reported levels by age or time to assist interpretation.

For hormones that vary by time of day like cortisol and melatonin, the graph shows the range as it changes over the course of a day and the test results are plotted on the graph according to the actual time of day the sample was collected. Ranges within the graphs are color-coded to show the degree of variation from the center of the normal range.

For hormones that vary in level with age, reports include graphs based on our database of testers not using hormone supplementation, showing the variation in levels with age. The test result is marked on each graph to indicate where the result falls in relation to the observed range for the tester's actual age.

TEST REPORT | Patient Reported Symptoms Comprehensive Female Profile II # 2018 08 02 200 SB

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 07/28/18	03/01/18	02/26/18
Estragen / Progesterone Deficiency	11%	14%	21%
Estragen Dominance / Progesterone Deficiency	8%	11%	15%
Low Androgens (DHEA/Testosterone)	21%	36%	39%
High Androgens (DHEA/Testosterone)	0%	15%	7%
Low Cortisol	22%	42%	47%
High Cortisol	7%	12%	17%
Hypometabolism	9%	27%	25%
Metabolic Syndrome	0%	2%	9%

SYMPTOM CHECKLIST

Symptom	07/28/18	03/01/18	02/26/18
Aches and Pains			
Acne			
Allergies			
Anxious			
Bleeding Changes			
Blood Pressure High			
Blood Pressure Low			
Blood Sugar Low			
Body Temperature Cold			
Bone Loss			
Breast Cancer			
Breasts - Fibrocystic			
Breasts - Tender			
Chemical Sensitivity			
Cholesterol High			
Constipation			
Depressed			
Fatigue - Evening			
Fatigue - Morning			
Fibromyalgia			
Foggy Thinking			
Galls			
Hair - Dry or Brittle			
Hair - Increased Facial or Body			
Hair - Scalp Loss			
Headaches			
Hearing Loss			
Heart Palpitations			
Hormones			
Hot Flashes			
Incontinence			
Intestinally			
Intestible			
Libido Decreased			
Memory Lapse			
Mood Swings			
Muscle Size Decreased			
Nails Breaking or Brittle			
Nervous			
Night Sweats			
Numbness - Feet or Hands			

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Symptoms

Patient symptoms are summarized into eight hormone imbalance conditions and scored with ● red, ● yellow or ● green bars to indicate severity.

Symptoms rated mild (1), moderate (2) or severe (3).

Sixty-eight symptoms, self-reported by the patient on the test requisition.

Please refer to our Symptom Guide available at www.zrtlab.com for details about symptom categories.

Comments (not pictured)

Individualized comments correlate lab results, symptoms, and hormone usage (if applicable). ZRT providers can choose to include their professional comments in addition to, or in lieu of, the lab comments. The Comments page is a thorough explanation that provides a better understanding of tested levels in relation to intensity of self-reported symptoms (mild, moderate, severe), menstrual history in women, and supplementation at the time of testing. The self-reported symptoms do not influence lab results, but are included in the individualized comments as they relate back to lab results.

! Test results are generally available 3-5 business days after samples are received at the lab.

Directory of Tests

Saliva, blood spot and dried urine are used for the minimally-invasive hormone testing that is the hallmark of ZRT Laboratory. The simplicity of sample collection and stability of samples in storage and transport have made these ideal for clinical use as well as research. Serum testing is now also available for some tests. See the table for a list of all our tests and assay methods used.

TESTS	CPT CODE	SALIVA	BLOOD SPOT	SERUM	DRIED URINE
Steroid Hormone Testing					
Estradiol (E2)**	82670	EIA*/LCMS	LCMS*	LIA*	GCMS
2-OH E2, 4-OH E2, 2-MeO E2, 4-MeO E2	82670				GCMS
Estriol (E3)	82677	LCMS*			GCMS
Estrone (E1)	82679	LCMS*			GCMS
2-OH E1, 4-OH E1, 16α-OH E1, 2-MeO E1, 4-MeO E1	82679				GCMS
Estrone-3-Glucuronide (E1G)	82679				EIA
Pregnenolone sulfate (PregS)	84140	LCMS			
Progesterone (Pg)**	84144	EIA*/LCMS	LCMS*	LIA*	
Pregnanediol (Pgdiol), Allopregnanediol (AlloPd)	84135				GCMS
Pregnanediol-3-Glucuronide (PDG)	84135				EIA
Allopregnanolone (AlloP)	84140	LCMS			GCMS
17-OH Progesterone (17OHPg)	83498	LCMS			
3α-dihydroprogesterone (3αHP)	84144				GCMS
20α-dihydroprogesterone (20α-HP)	83498				GCMS
Deoxycorticosterone (DOC)	82633				GCMS
Androstenedione (Adione)	82157	LCMS			GCMS
Testosterone (T)**	84402	LIA*/LCMS			
Testosterone (T)**	84403		LCMS*	LIA*	GCMS
Epi-testosterone (Epi-T)	82542				GCMS
5α-dihydrotestosterone (5α-DHT)	82642	LCMS			GCMS
DHEA (D)	82626	LCMS			GCMS
DHEA-S (DS)	82627	EIA*/LCMS	LCMS*	LIA*	
7-Keto DHEA (7keto)	82542	LCMS			
Etiocholanolone (Etio)	82696				GCMS
Androsterone (Andro)	82160				GCMS
5α,3α-Androstenediol (5α,3α)	82154				GCMS
11-Deoxycortisol (11DC)	82634	LCMS			
Cortisol (C)**	82530	EIA*/LCMS			
Cortisol (C)**	82533		LCMS*	LIA*	
Free Cortisol (FC)	82530				LCMS
Total Cortisol (TC)	82533				GCMS
Cortisone (Cn)	82530	LCMS			
Free Cortisone (FCn)	82530				LCMS
Total Cortisone (TCn)	82533				GCMS
Tetrahydrocortisol (ThC), Tetrahydrocortisone (ThCn)	83491				GCMS
Corticosterone (Ccn)	82528	LCMS			GCMS
Aldosterone (Ald)	82088	LCMS			
Hormone-Related Testing					
Bisphenol A (BPA)	82542				GCMS
Ethinyl estradiol (EE)	82670	LCMS			
Melatonin (Mel)	82542	LCMS			
Melatonin (MT6s)	82542				LCMS
Sex hormone binding globulin (SHBG)	84270		LIA*	LIA*	
Prostate-Specific Antigen (PSA)	84153		LIA*	LIA*	
Anastrozole (ANZ)	82542	LCMS			
Finasteride (FIN)	82542	LCMS			
Letrozole (LTZ)	82542	LCMS			
IGF-1 (Somatomedin C)	84305		LIA*	LIA*	

TESTS	CPT Code	SALIVA	BLOOD SPOT	SERUM	DRIED URINE
Luteinizing Hormone (LH)	83002		LIA*	LIA*	EIA
Follicle-Stimulating Hormone (FSH)	83001		LIA*	LIA*	
Vitamin D (25-OH D2/25-OH D3)	82306		LCMS*		
Ferritin (FER)	82728			LIA*	
Thyroid Testing					
Free Thyroxine (fT4)	84439		EIA*	LIA*	
Free Triiodothyronine (fT3)	84481		EIA*	LIA*	
Thyroglobulin (TG)	84432		LIA*		
Thyroid-Stimulating Hormone (TSH)	84443		LIA*	LIA*	
Thyroid Peroxidase Antibodies (TPOab)	86376		EIA*	LIA*	
Thyroxine (T4), total	84436		TRFIA*		
Cardiometabolic Testing					
Cholesterol (CH), total	82465		Enzymatic		
HDL Cholesterol (HDL)	83718		Enzymatic		
Hemoglobin A1c (HbA1c)	83036		ITA*		
High-Sensitivity C-Reactive Protein (hsCRP)	86141		EIA*		
Insulin (Ins), fasting	83525		EIA*		
Triglycerides (TG)	84478		Enzymatic*		
Neurotransmitter Testing					
5-Hydroxyindoleacetic acid (5-HIAA)	83497				LCMS
Dopamine (DA), DOPAC	82384				LCMS
Norepinephrine (NE), Epinephrine (Epi)	82384				LCMS
GABA, Glutamate (Glu), Glycine (Gly)	82139				LCMS
Tryptophan, Kynurenine, 3-Hydroxykynurenine	82139				LCMS
Taurine (Tau), Glutamine (Gln), Histidine (His)	82139				LCMS
Phenethylamine (PEA), N-Methylhistamine, Tyramine	82542				LCMS
Histamine (Hist)	83088				LCMS
Kynurenic acid (KynAC), Xanthurenic acid (Xanth)	83921				LCMS
Homovanillic acid (HVA)	83150				LCMS
Normetanephrine (NMN)	83835				LCMS
Serotonin (5-HT)	84260				LCMS
Tyrosine (Tyr)	84510				LCMS
Vanillylmandelic acid (VMA)	84585				LCMS
Creatinine (Crtn)	82570				LCMS
Heavy Metals & Essential Elements Testing					
Arsenic (As)	82175				ICPMS
Bromine (Br)	84311				ICPMS
Cadmium (Cd)	82300		ICPMS		ICPMS
Copper (Cu)	82525		ICPMS		
Iodine (I)	84311				ICPMS*
Lead (Pb)***	83655		ICPMS		
Lithium (Li)	80178				ICPMS
Magnesium (Mg)	83735		ICPMS		
Mercury (Hg)	83825		ICPMS		ICPMS
Selenium (Se)	84255		ICPMS		ICPMS
Zinc (Zn)	84630		ICPMS		
Adjunct to Urine Testing					
Creatinine (Crtn)	82570				Colorimetric

The American Medical Association's Current Procedural Terminology (CPT®) codes are provided for informational purposes only to assist with billing. ZRT assumes no responsibility for billing errors due to reliance on the published CPT codes.

*Available as a single or add-on test

**Tested in saliva, blood spot and serum. Saliva measures free (bioavailable) levels; blood spot and serum measure total (free plus protein-bound)

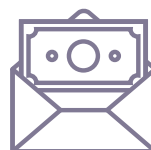
*** Only Available to Research Accounts

Payment Options & Billing Practices



Bill Provider (Domestic and Canada)

- ▶ Provider distributes kits to patients
- ▶ Provider is responsible for payment to ZRT and will be billed twice monthly for any completed report
- ▶ Automatic payment methods are available for provider convenience (required in Canada)
- ▶ Patient insurance billing is the responsibility of the provider (except Medicare, see below)
- ▶ Return shipping included



Patient Pay (Domestic Only)

- ▶ Provider distributes kits to patients
- ▶ Patient is responsible for payment to ZRT Laboratory
- ▶ We will courtesy bill a select group of insurances as a non-contracted provider at ZRT retail price
- ▶ Return shipping included



International

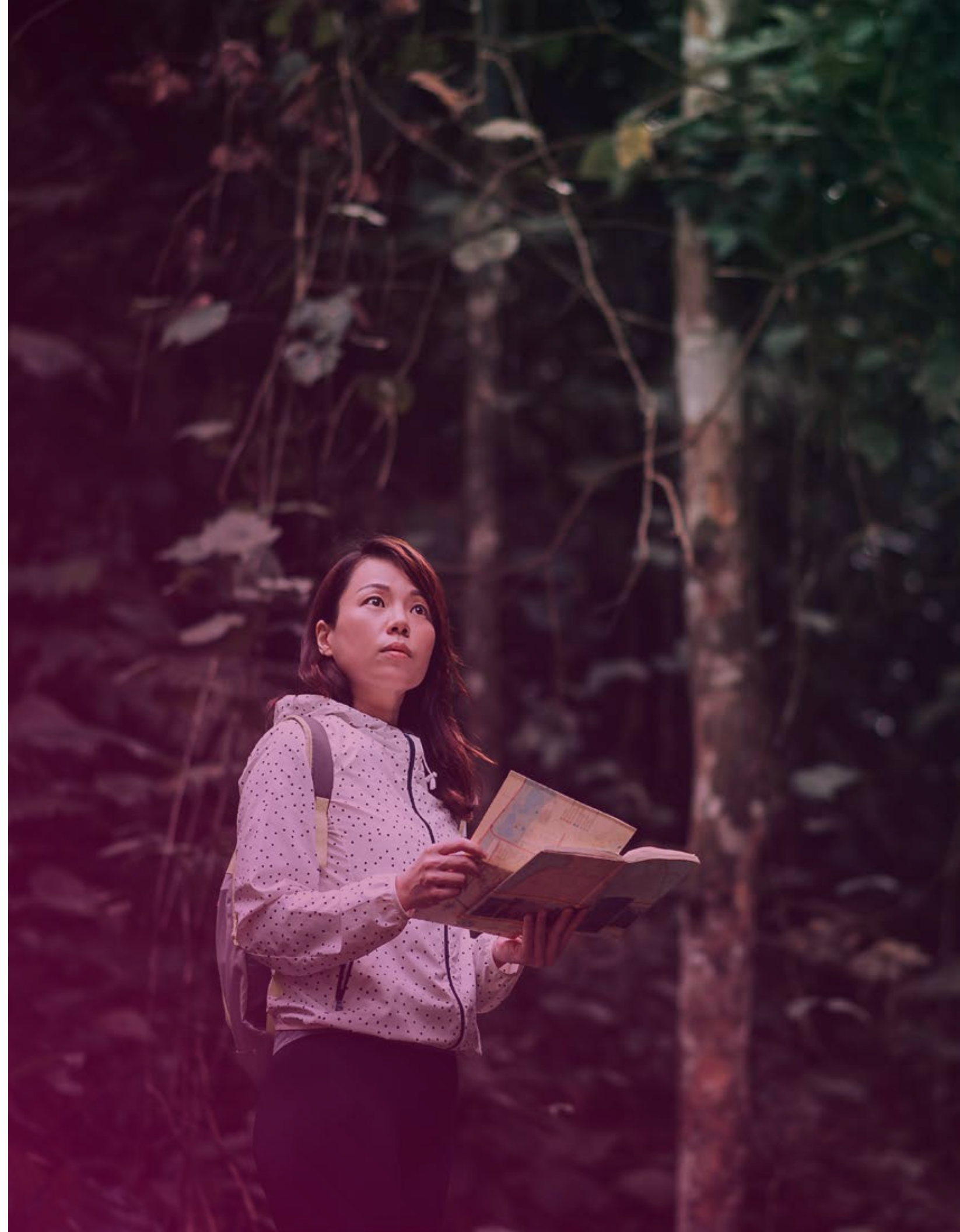
- ▶ Provider distributes kits to patients
- ▶ Provider is billed twice monthly for any report that has been completed (Patient Pay not available)
- ▶ Automatic payment required with this option
- ▶ International shipping charges apply for outbound orders
- ▶ Patient is responsible for return shipping costs

Insurance Billing

ZRT Laboratory will courtesy bill the following insurance companies: Original Medicare Part B, Medicare Advantage Plans, TRICARE, Cigna, Humana and Regence Blue Cross Blue Shield as a non-contracted provider at the ZRT retail price. Please note we do not file secondary insurance. We recommend patients check with their insurance companies regarding coverage prior to testing.

Medicare

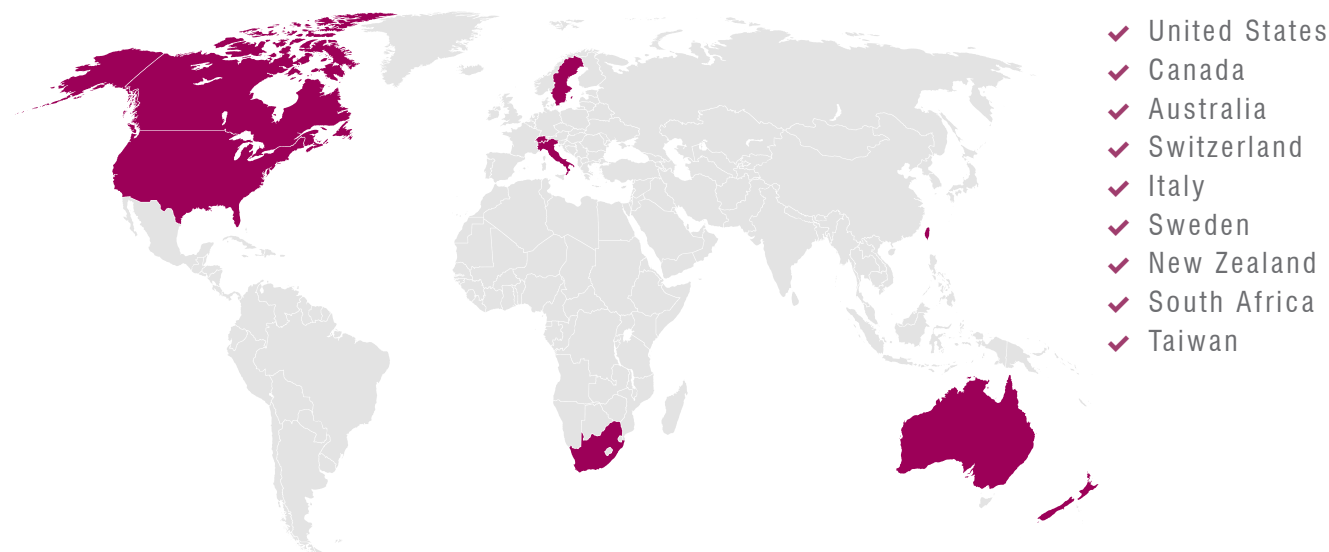
Prepayment is required for saliva testing or for any test ordered by providers outside the scope of their practices (ND, DC, LAC, etc.) or who are not enrolled with Medicare, as it is not covered. All providers must order Medicare Kits separately from standard test kits to satisfy Medicare regulations. ZRT Laboratory will courtesy bill Medicare for all payment options.



Clinical Research & Study Testing

Research is at the heart of everything we do.

The range of testing options we have developed is suited to research applications because samples are easy to collect, store, and ship for testing, and our results are highly accurate. Because collected samples are stable for weeks (saliva) or months (DBS and dried urine) and do not need to be shipped frozen, research can be carried out even in remote areas and samples shipped via regular mail.



► We are involved in research collaborations with academic institutions, research organizations and hospitals across the globe. The map above highlights countries where we currently have research involvement.

Pioneer Alongside ZRT Laboratory

We invite collaborations with clinicians involved in research, including partnerships in clinical trials that require a CLIA-certified testing laboratory for analyses. We provide sample collection materials for serum, saliva, DBS, or dried urine samples. Research samples are tested at ZRT by state-of-the-art methodology, including FDA-approved immunoassays, enzymatic assays, inductively-coupled plasma mass spectrometry (ICP-MS), gas chromatography tandem mass spectrometry (GC-MS/MS), and liquid chromatography tandem mass spectrometry (LC-MS/MS).

Visit our website to see a current list of published research papers and a list of abstracts and posters presented at scientific meetings.

LEARN MORE

If you are interested in a research collaboration with ZRT, or if you wish to partner with us for clinical trial testing, contact us for more information.

Call 1.866.600.1636 or visit www.zrtlab.com/research/research-collaboration-inquiry/

Abbreviation Key

2-Hydroxy Estradiol (2-OH E2)
 2-Hydroxy Estrone (2-OH E1)
 2-Methoxy Estradiol (2-MeO E2)
 2-Methoxy Estrone (2-MeO E1)
 3-Hydroxykynurenine (3-OHkyn)
 3α-Dihydroprogesterone (3αHP)
 3α-Hydroxysteroid Dehydrogenase (3α-HSD)
 3β-Hydroxysteroid Dehydrogenase (3β-HSD)
 4-Hydroxy Estradiol (4-OH E2)
 4-Hydroxy Estrone (4-OH E1)
 4-Methoxy Estradiol (4-MeO E2)
 4-Methoxy Estrone (4-MeO E1)
 5-Hydroxyindoleacetic Acid (5-HIAA)
 5-Hydroxytryptamine (5-HT)
 5α-Dihydrotestosterone (5α-DHT)
 5α-Reductase (5α-R)
 5β-Reductase (5β-R)
 3,4-Dihydroxyphenylacetic Acid (DOPAC)
 7-Keto Dehydroepiandrosterone (7keto)
 5α,3α-Androstenediol (5α3α)
 11-Deoxycortisol (11DC)
 11β-Hydroxylase (11β-OH)
 11β-Hydroxysteroid Dehydrogenase (11β-HSD)
 16α-Hydroxy Estrone (16α-OH E1)
 17-Hydroxyprogesterone (17-OHPg)
 17-OH Progesterone (17OHPg)
 17α-Hydroxylase (17α-OH)
 17β-Hydroxysteroid Dehydrogenase (17β-HSD)
 20α-Dihydroprogesterone (20αHP)
 20α-Hydroxysteroid Dehydrogenase (20α-HSD)
 21-Hydroxylase (21-OH)

A
 Aldehyde Dehydrogenases (ALDH)
 Aldehyde Reductase (AR)
 Aldosterone (ALD)
 Aldosterone Synthase (AS)
 Allopregnanediol (AlloPd)
 Allopregnanolone (AlloP)
 Anastrozole (ANZ)
 Androstenedione (Adione)
 Androsterone (Andro)
 Aromatic L-Amino Acid Decarboxylase (AADC)
 Arsenic (As)
 Arylalkylamine N-Methyltransferase (AANMT)
 Attention Deficit Disorder (ADD)
 Attention Deficit Hyperactivity Disorder (ADHD)

B
 Benign Prostatic Hyperplasia (BPH)
 Bisphenol A (BPA)
 Bromine (Br)

C
 Cadmium (Cd)
 Cardiovascular Disease (CVD)
 Catechol-O-Methyl-Transferase (COMT)
 Cholesterol (CH)
 Copper (Cu)
 Corticosterone (Ccn)
 Cortisol (C)
 Cortisol Awakening Response (CAR)
 Cortisone (Cn)
 Creatinine (Crtn)
 Cysteine Dioxygenase (CDO)
 Cysteine Sulfinic Acid Decarboxylase (CSAD)
 Cytochrome p450 (CYP)

D
 Dehydroepiandrosterone (DHEA)
 Dehydroepiandrosterone Sulfate (DHEA-S)
 Deoxycorticosterone (DOC)
 Dihydrotestosterone (DHT)

Diurnal 6-Sulfatoxymelatonin (MT6s)
 Dopamine (DA)
 Dopamine Beta-Hydroxylase (DBH)
 Dried Blood Spot (DBS)
 Dysfunctional Uterine Bleeding (DUB)

E
 Epinephrine (Epi)
 Epi-Testosterone (Epi-T)
 Erectile Dysfunction (ED)
 Estradiol (E2)
 Estriol (E3)
 Estrone (E1)
 Estrone-3-Glucuronide (E1G)
 Ethinyl Estradiol (EE)
 Etiocholanolone (Etio)

F
 Ferritin (FER)
 Finasteride (FIN)
 Folate (FOL)
 Follicle-Stimulating Hormone (FSH)
 Free Cortisol (FC)
 Free Cortisone (FCn)
 Free Thyroxine (fT4)
 Free Triiodothyronine (fT3)

G
 Gamma-Aminobutyric Acid (GABA)
 Glutamate (Glu)
 Glutamate Decarboxylase (GAD)
 Glutaminase (GLS)
 Glutamine (Gln)
 Glutamine Synthetase (GS)
 Glycine (Gly)
 Growth Hormone (GH)

H
 Hemoglobin A1c (HbA1c)
 High-Density Lipoprotein (HDL)
 High-Sensitivity C-Reactive Protein (hsCRP)
 Histamine (Hist)
 Histamine N-Methyltransferase (HNMT)
 Histidine Decarboxylase (HDC)
 Homocysteine (HCY)
 Homovanillic Acid (HVA)
 Hormone Replacement Therapy (HRT)
 Hydroxyindole-O-Methyltransferase (HIOMT)
 Hypotaurine Dehydrogenase (HD)
 Hypothalamic-Pituitary-Adrenal (HPA)

I
 Indoleamine-Pyrrole 2,3-Dioxygenase (IDO)
 Inductively-Coupled Plasma Mass Spectrometry (ICP-MS)
 Insulin (Ins)
 Insulin-Like Growth Factor 1 (IGF-1)
 Iodine (I)
 Iron (Fe)

K
 Kynurenic acid (KynAc)
 Kynurenine (Kyn)
 Kynurenine Aminotransferase (KAT)
 Kynurenine Hydroxylase/Monooxygenase (KMO)

L
 Lead (Pb)
 Letrozole (LTZ)
 Liquid Chromatography with Tandem Mass Spectrometry (LC-MS/MS)
 Lithium (Li)
 Low-Density Lipoprotein (LDL)
 Luteinizing Hormone (LH)

M
 Magnesium (Mg)

Manganese (Mn)
 Melatonin (Mel)
 Melatonin 6 Hydroxylase (M6H)
 Melatonin 6 Sulfotransferase (M6ST)
 Mercury (Hg)
 Methyltetrahydrofolate (MTHF)
 Molybdenum (Mo)
 Monoamine Oxidase (MAO)

N
 National Institutes of Health (NIH)
 N-Formyl Kynurenine Formamidase (FKF)
 N-Methylhistamine (N-MeHist)
 Norepinephrine (NE)
 Normetanephrine (NMN)

O
 Obsessive Compulsive Disorder (OCD)

P
 Phenethylamine (PEA)
 Phenylalanine Hydroxylase (PAH)
 Phenylethanolamine N-Methyltransferase (PNMT)
 Polycystic Ovary Syndrome (PCOS)
 Pregnanediol (Pgdiol)
 Pregnanediol-3-Glucuronide (PDG)
 Pregnenolone Sulfate (PregS)
 Premenstrual Dysphoric Disorder (PMDD)
 Premenstrual Syndrome (PMS)
 Progesterone (Pg)
 Prolactin (PRL)
 Prostate Specific Antigen (PSA)

S
 S-adenosylmethionine (SAME)
 Selenium (Se)
 Serine Hydroxymethyl Transferase (SHMT)
 Serotonin 5-Hydroxytryptamine (5-HT)
 Sex Hormone Binding Globulin (SHBG)
 Sulfatase (SU)
 Sulfotransferase (ST)

T
 Tandem Mass Spectrometry (GC-MS/MS)
 Taurine (Tau)
 Testosterone (T)
 Tetrahydrobiopterin (BH4)
 Tetrahydrocortisol (ThC)
 Tetrahydrocortisone (ThCn)
 Threonine Aldolase (Thra)
 Thyroglobulin (Tgtn)
 Thyroid Peroxidase Antibodies (TPOab)
 Thyroid Peroxidase (TPO)
 Thyroid-Stimulating Hormone (TSH)
 Thyroxine (T4)
 Total Cortisol (TC)
 Total Cortisone (TCn)
 Triglycerides (TG)
 Tryptophan (Trp)

Tryptophan Hydroxylase (TPH)
 Tryptophan 2,3-Dioxygenase (TDO)
 Tyramine (Tyra)
 Tyrosine (Tyr)
 Tyrosine Decarboxylate (TD)
 Tyrosine Hydroxylase (TH)

V
 Vanillylmandelic Acid (VMA)
 Very-Low-Density Lipoprotein (VLDL)

X
 Xanthurenic Acid (Xanth)

Z
 Zinc (Zn)

General Information



Contact Info

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CPT Codes

The American Medical Association's Current Procedural Terminology (CPT®) codes in ZRT Laboratory's Test Directory are provided for informational purposes only. CPT codes are provided only as a guide to assist providers with billing. ZRT recommends that clients confirm CPT codes with their Medicare administrative contractor, as requirements may differ. CPT coding is the sole responsibility of the billing party. ZRT assumes no responsibility for billing errors due to reliance on the published CPT codes.

Health Insurance Portability & Accountability Act (HIPAA)

ZRT Laboratory is committed to complying with privacy and security standards outlined in the Health Insurance Portability and Accountability Act (HIPAA) and the Health Information Technology for Economic and Clinical Health Act. Notice of Privacy Practices may be found at www.zrtlab.com.

