



# Testing Catalog

A COMPLETE GUIDE TO ZRT LABORATORY



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

## ***Table of Contents***

About ZRT Laboratory .....	1
A Note from our Founder .....	2
The ZRT Difference .....	3
Overview of Kits .....	5
Multiple Testing Options – Your Choice .....	7
<b>Our Comprehensive Range of Test Specialties .....</b>	<b>9</b>
Reproductive Hormone Testing .....	11
Hormone Metabolites .....	16
Adrenal/Stress Testing .....	19
Thyroid Testing .....	20
Heavy Metals & Essential Elements Testing .....	22
Neurotransmitter Testing .....	24
Wellness Testing .....	28
Methylation & Memory Testing .....	30
Understanding ZRT’s Test Report .....	31
Directory of Tests & CPT codes .....	33
Billing Practices .....	35
Clinical Research & Study Testing.....	37
General Information .....	40





## 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 4 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*

## 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 – Portland, OR

ZRT Laboratory is a CLIA-certified commercial and research laboratory founded by breast cancer researcher David Zava, Ph.D. 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.

# 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.
- ✓ Turn-around time 3-5 business days.

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

## 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**



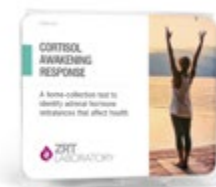
### SLEEP BALANCE

- 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](http://www.myZRT.com) or by phone at 866.600.1636 or +1.503.466.2445.

# Multiple Testing Options – Your Choice

ZRT offers testing in 4 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.



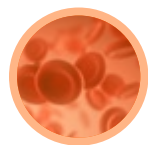
## SALIVA TESTING

### 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 Sjogren's Syndrome



## BLOOD TESTING DRIED BLOOD SPOT OR SERUM

### 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 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 4 time points for stress assessment
- Assessing nocturnal and diurnal melatonin production

### Not suitable for:

- Monitoring topical or intravaginal hormone replacement therapy

### Testing Sex Steroid Hormones in Different Test Media Following Different Routes of Hormone Administration

- Endogenous sex hormone levels are identical in serum and blood spot. But when topical or vaginal hormone therapy is used, blood spot has an advantage in that it reflects tissue uptake of the administered hormone.
- Saliva testing can be used to monitor all types of hormone supplementation except troche/sublingual hormones because of direct contamination of the sample with the administered hormone.
- Dried urine is generally not suitable for monitoring sex hormone replacement because it does not reflect tissue uptake of topical steroids, is subject to contamination with vaginally delivered hormones, and hormone metabolites interfere with testing levels of oral and pellet dosage forms.



### 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/](http://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 ..... Page 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 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 hormones and BDNF. If these are not at optimal levels, risks for cardiovascular disease 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 bed-time 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

## Female Blood Profiles I & II

Two dried blood spot 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

## Male Blood Profiles I & II

Two dried blood spot 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

### Consider for Women:

Baseline levels before hormone replacement therapy, amenorrhea, PMS, dysfunctional uterine bleeding (DUB), estrogen dominance symptoms, hypogonadism, sexual dysfunction, osteoporosis, fibrocystic breast disease, infertility screening, polycystic ovarian syndrome (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, erectile dysfunction, infertility, osteoporosis screening, and adrenal dysfunction.

**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 (dysfunctional uterine bleeding), 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 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, erectile dysfunction (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

## 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

## Comprehensive Female Profiles

These profiles include both saliva and dried blood spot 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

### Consider for Women:

Baseline levels before hormone replacement therapy, amenorrhea, PMS, DUB (dysfunctional uterine bleeding), 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, erectile dysfunction, osteoporosis screening.

### Consider for Women:

Baseline levels before hormone replacement therapy, amenorrhea, PMS, DUB (dysfunctional uterine bleeding), 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, erectile dysfunction (ED), osteoporosis screening.

**Comprehensive Female Profile I** combines ZRT's popular Salivary Hormone Profile III with our Essential Thyroid Profile tests in dried blood spot.

**Comprehensive Female Profile II** tests only the diurnal cortisol in saliva, while the sex and thyroid hormones are all tested in dried blood spot. Allows physicians to assess baseline levels before hormone replacement therapy; 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 (dysfunctional uterine bleeding), 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 dried blood spot 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 dried blood spot. 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 dried blood spot. 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, erectile dysfunction (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.*

## 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 dried blood spot 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. Dried blood spot samples are collected on days 3 and 21 of the menstrual cycle, and saliva samples are collected only on day 21. LH and FSH are tested on day 3, while on day 21 estradiol, progesterone, testosterone, DHEA-S, SHBG, and the thyroid hormones are tested in dried blood spot 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

## 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

### Consider for:

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

## 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 dried blood spot 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, dysfunctional uterine bleeding, estrogen dominance symptoms, hypogonadism, sexual dysfunction, osteoporosis, fibrocystic breast disease, infertility screening, PCOS screening, anovulation, menopausal symptoms, 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.

### Consider for:

Consider for women with irregular cycles, cyclic hormone-related symptoms such as pre-menstrual syndrome (PMS) or headaches, infertility, or luteal phase defects to determine the source of their problems.

## 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, progesterone 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

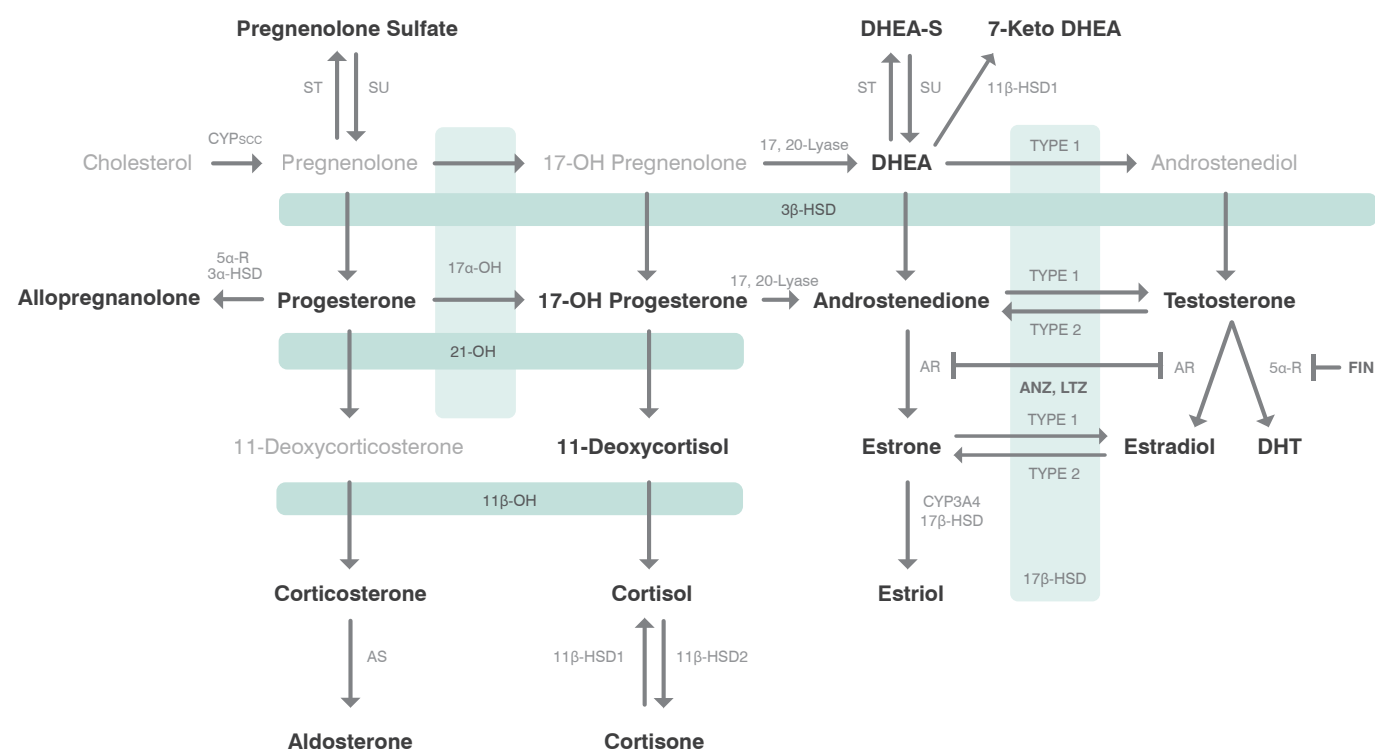
Five profiles give a broad range of choices for an assessment of how patients are metabolizing a variety of hormones.

### 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 hormone replacement therapy.



### 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.



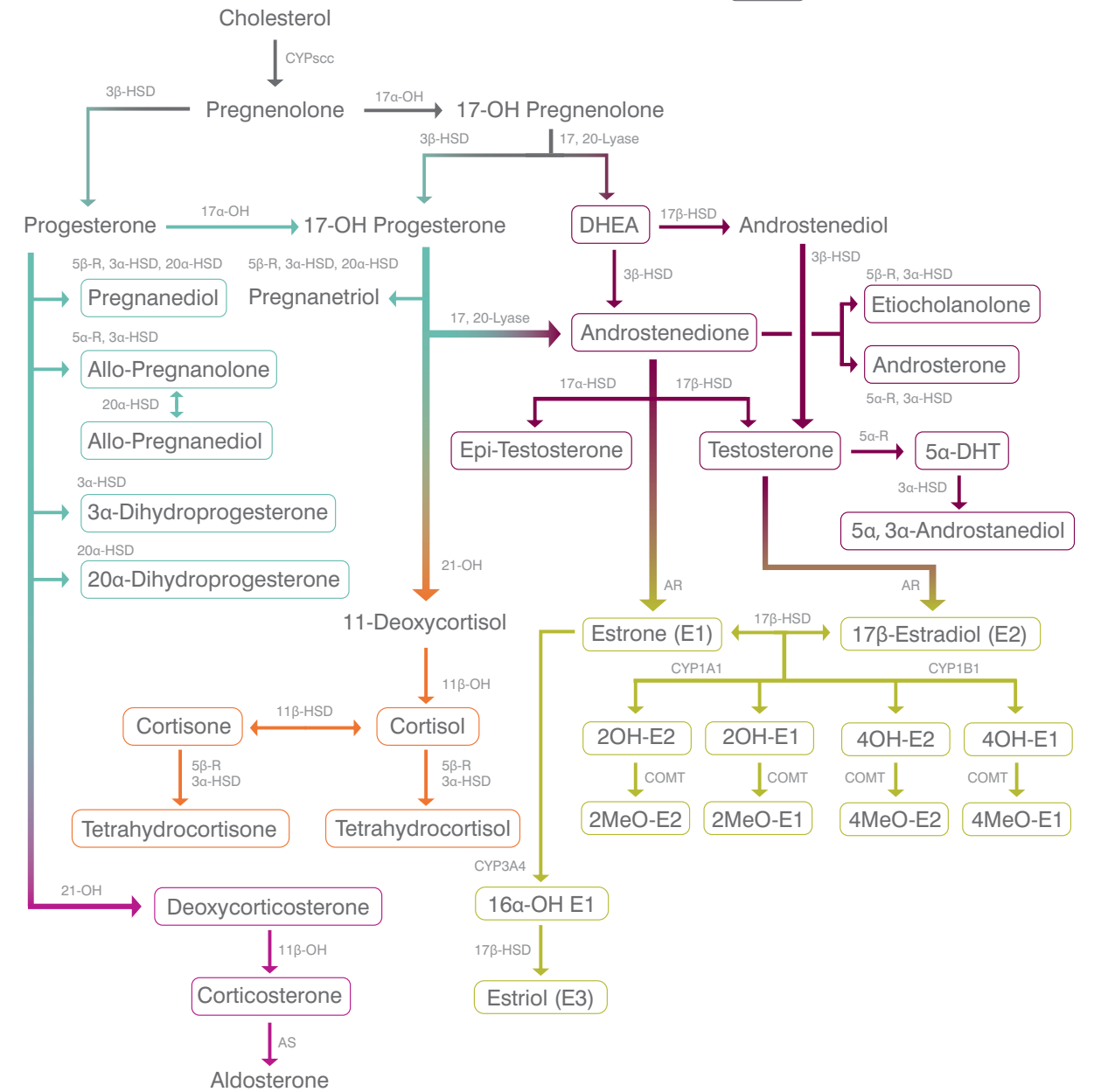
## Urine Hormone Metabolites Profiles

Urine Metabolites Profile Options	Adrenal	Estrogen Essential	Estrogen Elite	Basic	Advanced
<b>ESTROGENS</b>					
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)			•		•
<b>PROGESTOGENS</b>					
Pregnanediol (Pgdiol)			•	•	•
Allopregnanolone (AlloP)			•	•	•
Allopregnanediol (AlloPd)					•
3α-Dihydroprogesterone (3αHP)					•
20α-Dihydroprogesterone (20αHP)					•
Deoxycorticosterone (DOC)					•
Corticosterone (Ccn)					•
<b>ANDROGENS</b>					
DHEA (D)	•		•	•	•
Androstenedione (Adione)			•	•	•
Androsterone (Andro)					•
Etiocholanolone (Etio)					•
Testosterone (T)			•	•	•
Epi-Testosterone (Epi-T)			•	•	•
5α-Dihydrotestosterone (5α-DHT)			•	•	•
5α,3α-Androstenediol (5α3α)					•
<b>GLUCOCORTICOIDS</b>					
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	(5α-R) 5α-Reductase	(11β-HSD) 11β-Hydroxysteroid dehydrogenase
• Estrogens	(5β-R) 5β-Reductase	(17α-HSD) 17α-Hydroxysteroid dehydrogenase
• Glucocorticoids	(11β-OH) 11β-Hydroxylase	(17β-HSD) 17β-Hydroxysteroid dehydrogenase
• Mineralocorticoids	(17α-OH) 17α-Hydroxylase	(20α-HSD) 20α-Hydroxysteroid dehydrogenase
• Progestogens	17,20-Lyase (same enzyme as 17α-OH)	(AR) Aromatase
	(21-OH) 21-Hydroxylase	(AS) Aldosterone Synthase
	(3α-HSD) 3α-Hydroxysteroid dehydrogenase	(CYP) Cytochrome p450 (scc, 1A1, 1B1 & 3A4)
	(3β-HSD) 3β-Hydroxysteroid dehydrogenase	(COMT) Catechol-O-Methyl-Transferase



## Diurnal Cortisol Profile

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

- ✓ **Diurnal Cortisol Profile includes:** 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, TPOab
- ✓ **Elite Thyroid Profile includes:** T4, Tgbn, TSH, fT3, fT4, TPOab

**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, Hashimotos, 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 dried blood spot 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, TPOab

**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 dried blood spot 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 dried blood spot 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 dried blood spot.

**Comprehensive Female Profile II** tests only the diurnal cortisol in saliva, while the sex and thyroid hormones are all tested in dried blood spot. Allows physicians to assess baseline levels before hormone replacement therapy; 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 (dysfunctional uterine bleeding), 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 dried blood spot. 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 dried blood spot. 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, erectile dysfunction (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 3 of the 4 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. Dried blood spot 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, Lead\*

\*Only Available to Research Accounts

**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; 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 4 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, Lead\*

\*Only Available to Research Accounts

## 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; 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

In the neurological system, hormones are synergistic with neurotransmitters – modulating their production, signaling and metabolism. Because of this complex interplay, testing hormones and neurotransmitters together is an ideal way to generate a more precise clinical assessment. Elements are also important for brain health - deficiencies in iodine or selenium compromise the neuroprotective functions of thyroid hormones and lithium is implicated in neuroprotection and regeneration. Heavy metals on the other hand disrupt neurotransmitter synthesis, metabolism, and signaling, contributing to the burden of neurological dysfunction.

Combined testing of neurotransmitters with hormones and/or neurotransmitters with heavy metals and nutrients gives practitioners a diagnostic edge over the traditional psychological inventory. It offers the advantage of zeroing in on which therapies are best suited for individual patients – cutting down on the time-consuming process of trial-and-error for identifying treatment options. This testing also allows practitioners to monitor individual biochemical changes during and after intervention.

### ✓ 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:

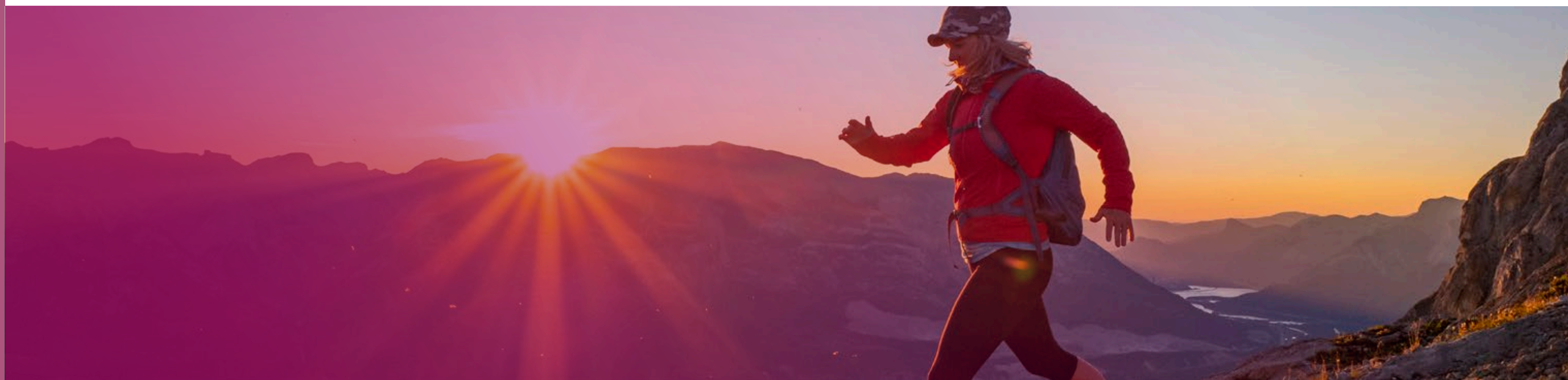
Testing neurotransmitters in patients with a suspected neurochemical imbalance can help assess individual biochemistry and get to the root of persistent issues such as:

- 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.*

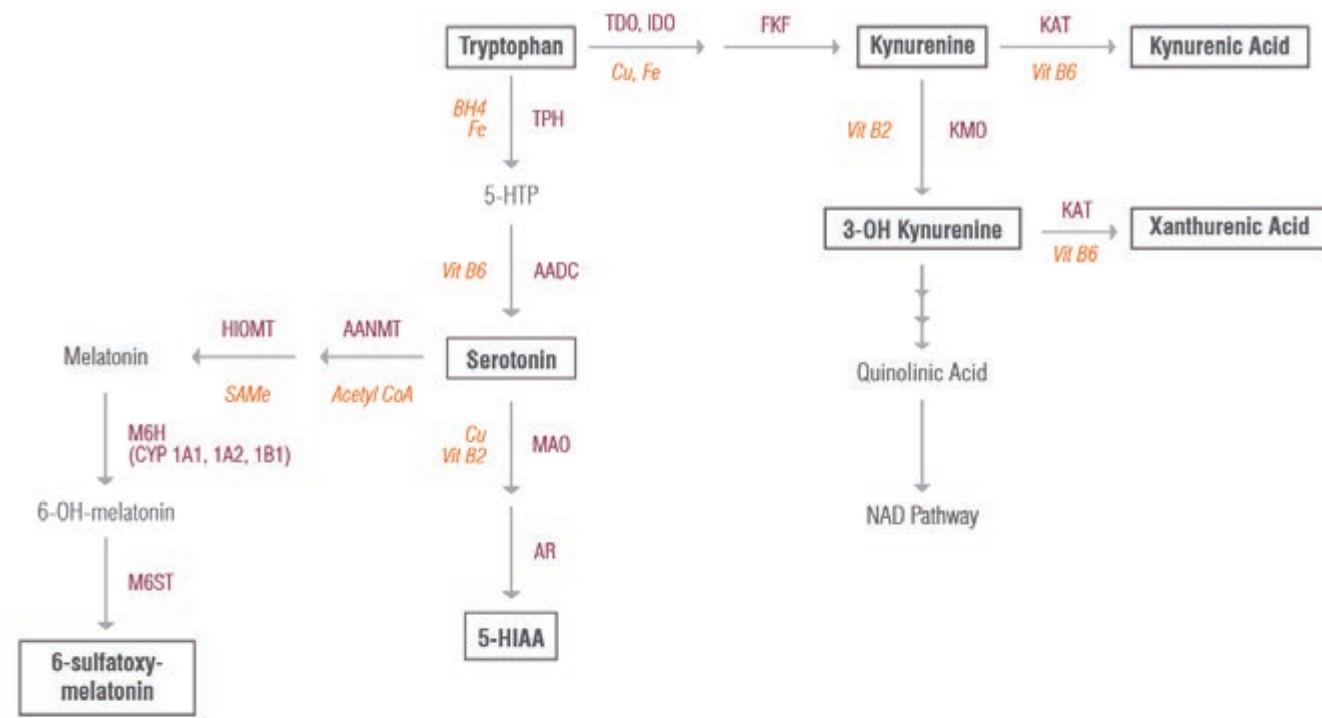
### + Add-On Options

- **Saliva Hormones**  
E2, Pg, T, DS, C
- **Urine Hormones**  
E2, Pregnanediol, Allopregnanolone, Androstenedione, T, Epi-T, DHT, DHEA, 5α,3α-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

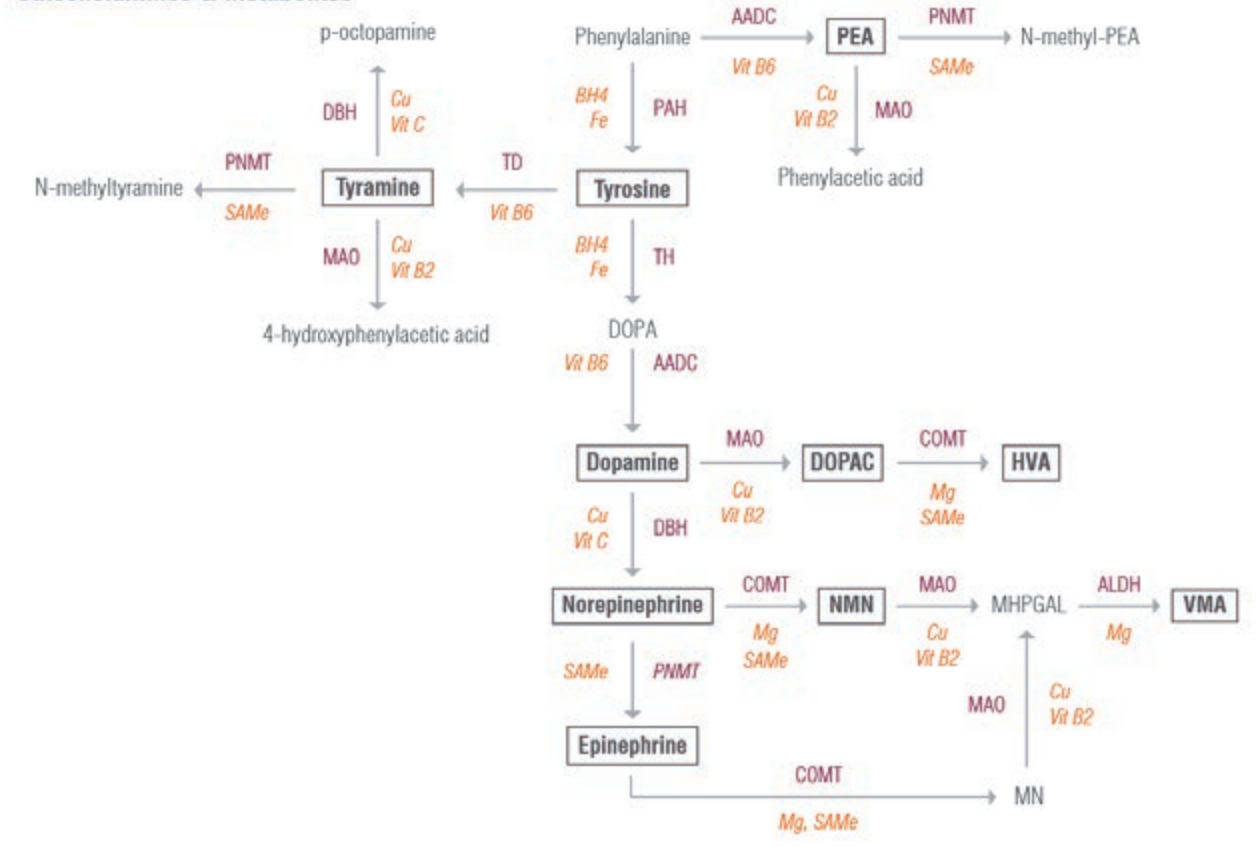




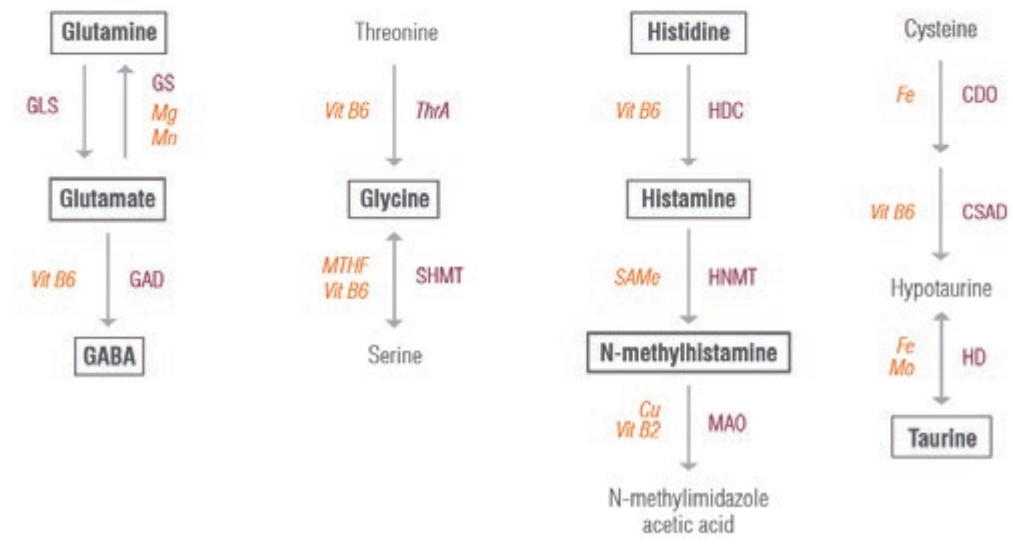
# Neurotransmitter Cascades



## Catecholamines & Metabolites



## Glutamate/GABA, Glycine, Histamine & Taurine



## Abbreviations & Key

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

## 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

## CardioMetabolic Profile

This profile, entirely in dried blood spot 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 cardiovascular disease (CVD) risks.

✓ **CardioMetabolic Profile includes:**

Blood Spot: Insulin, hsCRP, HbA1c, TG, CH, HDL, LDL, VLDL

+ **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** 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 / cardiovascular disease 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.*

**Consider for:**

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

# The Wellness Suite

Wherever you are on your wellness journey, there is a profile to help you maximize your 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, 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 cardiovascular disease 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 cardiovascular disease and dementia can increase. A test for brain-derived neurotrophic factor (BDNF), important in the development of healthy neurons, is included. This is vital for assessing nervous system health, especially in concert with steroid and thyroid hormones that regulate its production.

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

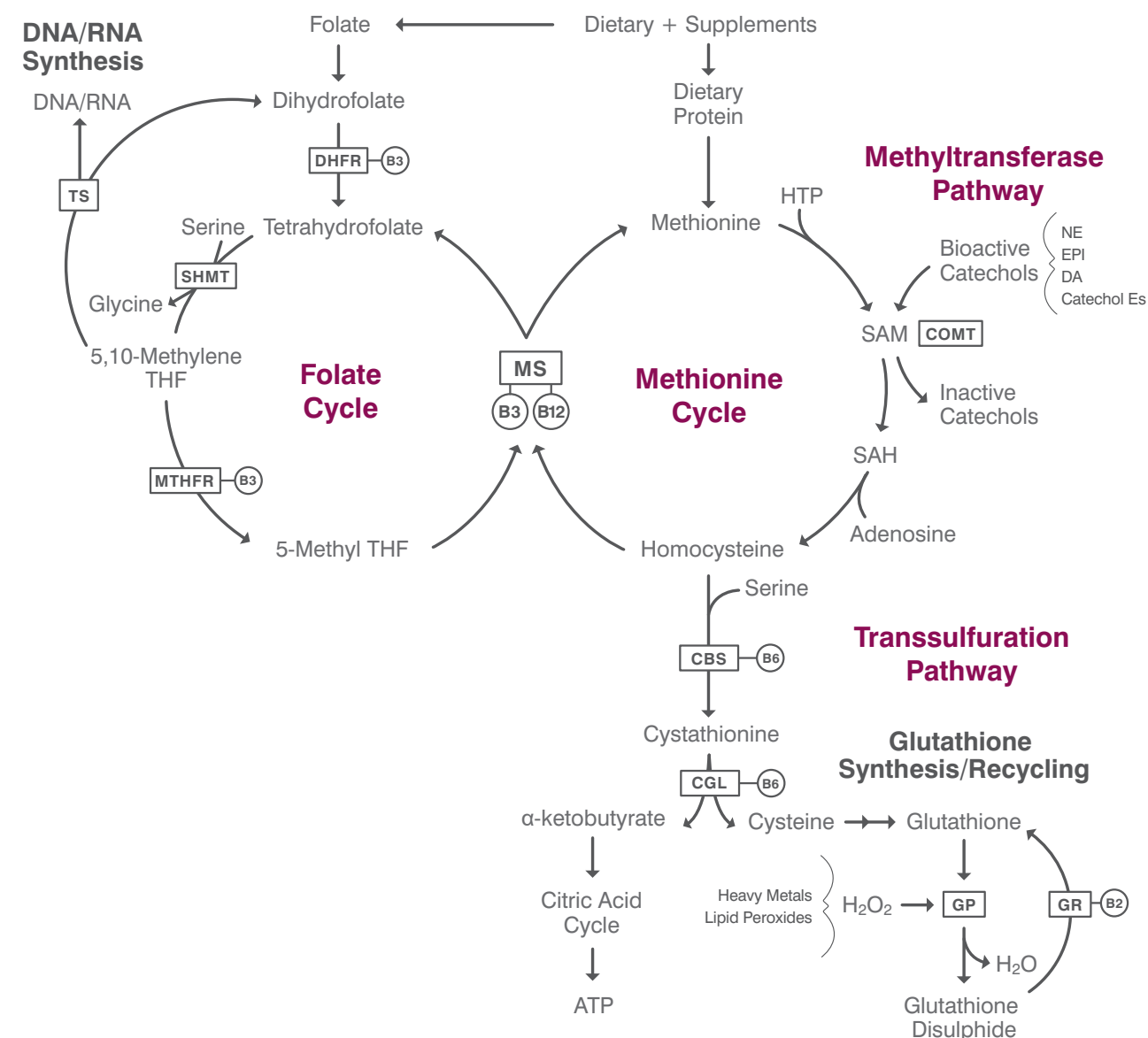
### Consider for:

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

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

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

Gender	Last Menses	Height	Waist
Female	Unspecified	5 ft 8 in	Unspecified
DOB	Menses Status	Weight	BMI
9/30/1964 (53 yrs)	Hysterectomy (ovaries removed)	134 lb	23.4

TEST NAME	RESULTS   07/28/18	03/01/18	02/26/18	RANGE
<b>Salivary Steroids</b>				
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)
<b>Blood Spot Steroids</b>				
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 <sup>(1)</sup>		34 <sup>(2)</sup>	<sup>(1)</sup> 20-130 ng/dL Premeno-luteal or TRT <sup>(2)</sup> 10-45 ng/dL Postmenopausal
SHBG	87			15-120 nmol/L
DHEAS	70			40-290 µg/dL
<b>Blood Spot Thyroids</b>				
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)

<dL = Less than the detectable limit of the lab. N/A = Not applicable. 1 or more values used in this calculation is less than the detectable limit. H = High. L = Low. \* 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 DHEA (OTC) (1 Days Last Used)5mg topical Testosterone (compounded) (1 Days Last Used)5mg sublingual (SL) DHEA (OTC) (1 Days Last Used)500mg oral L-Levothyroxine (14) (Pharmaceutical) (1 Days Last Used)50mg oral Armour (glandular Thyroid) (Pharmaceutical) (1 Days Last Used) oral T4 (13) (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.

03/01/2018 09:05AM 8/15/2018 8:12:43 AM

## 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
Estrogen / Progesterone Deficiency	11%	14%	21%
Estrogen 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**

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			
Galler			
Hair - Dry or Brittle			
Hair - Increased Facial or Body			
Hair - Scalp Loss			
Headaches			
Hearing Loss			
Heart Palpitations			
Hormones			
Hot Flashes			
Incontinence			
Intestinally			
Irritable			
Libido Decreased			
Memory Lapse			
Mood Swings			
Muscle Size Decreased			
Nails Breaking or Brittle			
Nervous			
Night Sweats			
Numbness - Feet or Hands			

03/01/2018 09:05AM 8/15/2018 8:12:43 AM

## Symptoms

Patient symptoms are summarized into 8 hormone imbalance conditions and scored with ● red, ● yellow or ● green bars to indicate severity.

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

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

Please refer to our Symptom Guide available at [www.zrtlab.com](http://www.zrtlab.com) for details about symptom categories.

## Comments (not pictured)

Individualized comments which 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 which 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.**

UNDERSTANDING ZRT'S TEST REPORT

31

32



# 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
<b>Steroid Hormone Testing</b>					
Estradiol (E2)**	82670	EIA*/LCMS	LCMS*	LIA*	GCMS
2-OH E2, 4-OH E2, 2-MeO E2, 4-MeO E2	82670				GCMS
Estrinol (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			
Etiocolanalone (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			
<b>Hormone-Related Testing</b>					
Bisphenol A	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		EIA*	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*		
Growth Hormone (GH)	83003			LIA*	
Prolactin (PRL)	84146			LIA*	
Ferritin (FER)	82728			LIA*	
Folate (FOL)	82746			LIA*	
Vitamin B12 (B12)	82607			LIA*	
Homocysteine (HCY)	83090			LIA*	
Brain Derived Neurotrophic Factor (BDNF)	83516			EIA*	
<b>Thyroid Testing</b>					
Free Thyroxine (fT4)	84439		EIA*	LIA*	
Free Triiodothyronine (fT3)	84481		EIA*	LIA*	
Thyroglobulin	84432		LIA*		
Thyroid Stimulating Hormone (TSH)	84443		LIA*	LIA*	
Thyroid Peroxidase Antibodies (TPOab)	86376		EIA*	LIA*	
Thyroxine (T4), total	84436		TRFIA*		
<b>Cardiometabolic Testing</b>					
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*		
<b>Neurotransmitter Testing</b>					
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, Glutamine, Histidine	82139				LCMS
Phenethylamine (PEA), N-Methylhistamine, Tyramine	82542				LCMS
Histamine (HIST)	83088				LCMS
Kynurenic acid, Xanthurenic acid	83921				LCMS
HVA	83150				LCMS
Normetanephrine (NMN)	83835				LCMS
Serotonin (5-HT)	84260				LCMS
Tyrosine	84510				LCMS
VMA	84585				LCMS
Creatinine (Crtn)	82570				LCMS
<b>Heavy Metals &amp; Essential Elements Testing</b>					
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		
<b>Adjunct to Urine Testing</b>					
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

# Clinical Research & Study Testing

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 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, dried blood spot, 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).

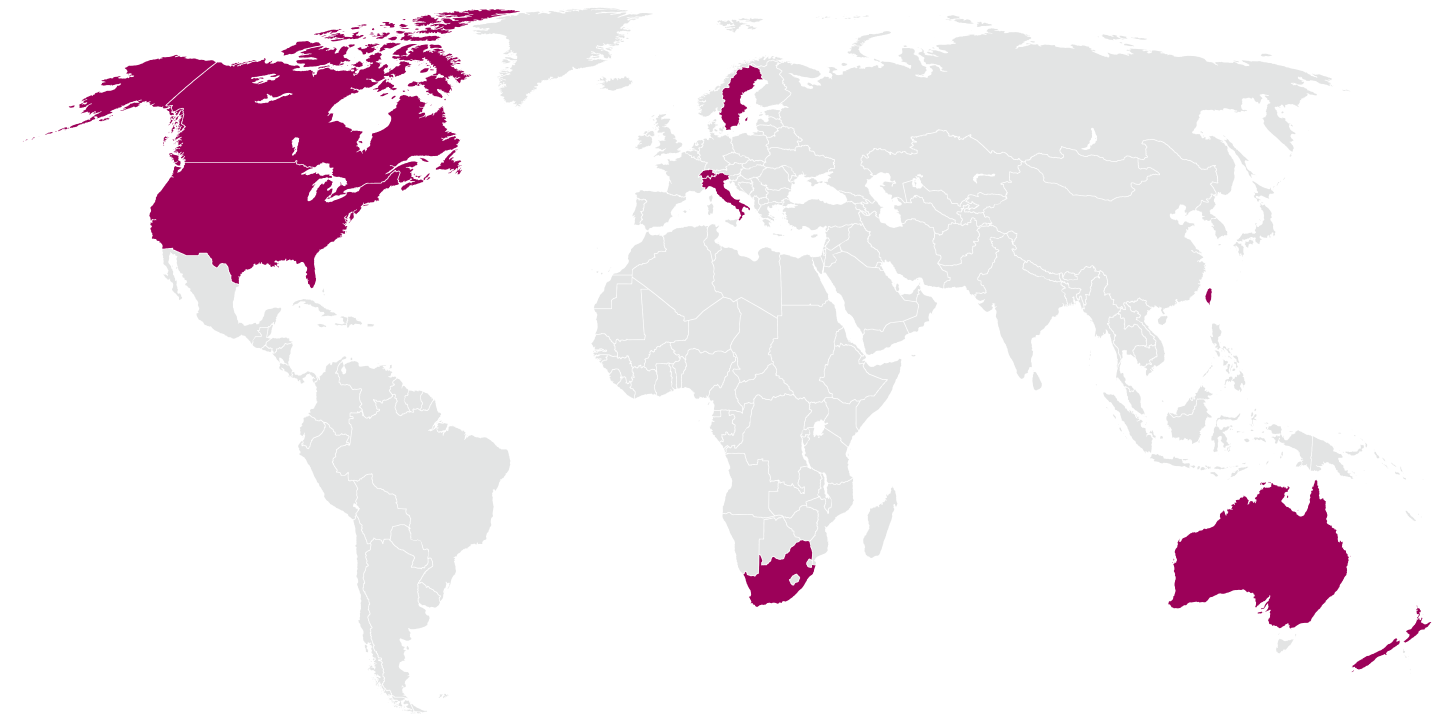
Visit our website to see a current list of published research papers and a list of abstracts and posters presented at scientific meetings.



# Pioneer Alongside ZRT Laboratory

**Research is at the heart of everything we do.** We are involved in research collaborations with academic institutions, research organizations and hospitals across the globe. The below map highlights countries where we currently have research involvement.

- ✓ United States
- ✓ Canada
- ✓ Australia
- ✓ Switzerland
- ✓ Italy
- ✓ Sweden
- ✓ New Zealand
- ✓ South Africa
- ✓ Taiwan



## 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/](http://www.zrtlab.com/research/research-collaboration-inquiry/)





# General Information



## Contact Info

**Telephone:** 503.466.2445  
**Toll-free:** 1.866.600.1636  
**Fax:** 503.466.1636  
**Email:** [info@zrtlab.com](mailto:info@zrtlab.com)  
**Website:** [www.zrtlab.com](http://www.zrtlab.com)



## Mailing Address

**ZRT Laboratory**  
8605 SW Creekside Place  
Beaverton, OR 97008

---

## 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](http://www.zrtlab.com).

---

