GUIDE TO TESTING
SALIVA • BLOOD SPOT • DRIED URINE
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GUIDELINES FOR SELECTING A TEST MEDIUM

SALIVA TESTING

- ZRT developed the methodology making saliva hormone testing commercially viable
- Only lab to perform extraction - the accepted methodology for research studies
- No freezing / refrigeration or special shipment required
- Samples stable at room temperature for 30 days

Suitable for:
- Assessing “free” (unbound to carrier proteins) hormone levels
- Monitoring hormone replacement given orally, topically, vaginally or via pellets
- Determining diurnal cortisol levels (4 times during one day) for adrenal stress assessment

Not suitable for:
- Monitoring sublingual/troche hormone replacement
- Patients with dry mouth, e.g. due to Sjogren’s Syndrome

BLOOD SPOT TESTING

- ZRT developed the science for accurately measuring steroid hormones in dried blood spot and is the only lab to offer this technology commercially
- No phlebotomist, freezing / refrigeration or special shipment required
- Hormones and other analytes stable at room temperature for 30 days

Suitable for:
- Patients with dry mouth and/or children who may have difficulty collecting saliva
- Monitoring all hormone replacement therapy (oral, topical, vaginal, sublingual, pellet)
- Assessing interstitial tissue/capillary hormone levels
- Assessing thyroid health, fertility parameters, toxic and nutritional elements, and cardiometabolic risk factors

Not suitable for:
- Patients who are uncomfortable about collecting their own sample (samples may be collected in provider’s office)
URINE TESTING

- Dried urine testing is the latest scientific advancement pioneered by ZRT Laboratory
- Eliminates the disadvantages of 24-hour liquid urine collections commonly used for testing
- No freezing / refrigeration or special shipment required
- Samples stable at room temperature for 30 days

**Suitable for:**
- Measuring steroid hormone metabolites, e.g., for breast cancer risk assessment
- Measuring neurotransmitter levels
- 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

SERUM TESTING

- Broadly accepted method for measuring hormones & other analytes

**Suitable for:**
- Measuring endogenous hormones
- Monitoring hormone replacement given orally, or via patch or pellets

**Not suitable for:**
- Monitoring topical or intravaginal hormone replacement therapy

Guide to Steroid Hormone Testing in Different Body Fluids Following Different Routes of Hormone Administration

<table>
<thead>
<tr>
<th>BODY FLUID</th>
<th>No Exogenous Steroids</th>
<th>Oral Steroids</th>
<th>Topical Steroids</th>
<th>Vaginal Steroids</th>
<th>Troche/Sublingual Steroids</th>
<th>Pellet/IM Steroids</th>
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<tbody>
<tr>
<td>Serum</td>
<td>yes</td>
<td>yes(^1)</td>
<td>no(^2)</td>
<td>no(^2)</td>
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<td>yes</td>
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<tr>
<td>Saliva</td>
<td>yes</td>
<td>yes</td>
<td>yes(^3)</td>
<td>yes</td>
<td>no(^4)</td>
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<td>Dried Urine</td>
<td>yes</td>
<td>yes(^1)</td>
<td>no(^2)</td>
<td>no(^5)</td>
<td>yes</td>
<td>yes(^1)</td>
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<tr>
<td>Dried Blood Spot</td>
<td>yes</td>
<td>yes</td>
<td>yes(^6)</td>
<td>yes</td>
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**Key**
1. Overestimation: Metabolites interfere with immunoassays
2. Underestimation: Hormone levels not reflective of tissue uptake
3. Overestimation: Requires range adjustment
4. Overestimation: Direct contamination of oral mucosa / saliva
5. Overestimation: Direct contamination of urine
6. Overestimation: IF fingertips contaminated with topical hormones
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 tables for a list of all our current offerings.

<table>
<thead>
<tr>
<th>TEST</th>
<th>CPT Code</th>
<th>ASSAY TYPE**</th>
<th>BLOOD SPOT</th>
<th>SALIVA</th>
<th>DRIED URINE</th>
<th>AVAILABLE AS SINGLE OR ADD-ON TEST***</th>
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<td>Copper (Cu)</td>
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</table>

| ADJUNCT TO URINE TESTS      |          |              |            |        |             |                                      |
| Creatinine (Cr)****         | 82570    | Colorimetric |            |        |             |                                      |

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

** Explanation of assay type abbreviations:
- **EIA** = Enzyme Immunoassay
- **GC-MS/MS** = Gas Chromatography/Tandem Mass Spectrometry
- **ICPMS** = Inductively Coupled Plasma Mass Spectrometry
- **ITF** = Immunoturbidimetric Assay
- **LC-MS/MS** = Liquid Chromatography/Tandem Mass Spectrometry
- **LIA** = Luminescence Immunoassay

*** Any test offered as a Single Test can be added to any other test or profile at a discounted price.

**** Creatinine is included with all urine tests as a correction factor for urine dilution.
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.

<table>
<thead>
<tr>
<th>TEST</th>
<th>CPT Code</th>
<th>ASSAY TYPE**</th>
<th>BLOOD SPOT</th>
<th>SERUM</th>
<th>SALIVA</th>
<th>DRIED URINE</th>
<th>AVAILABLE AS SINGLE OR ADD-ON TEST***</th>
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<tbody>
<tr>
<td>Estradiol (E2)*</td>
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<td>●</td>
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<tr>
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<td>Estriol (E3)</td>
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<td>Progesterone (pg)*</td>
<td>84144</td>
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<td>Progesterone (pg)*</td>
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<td>Testosterone (T)*</td>
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<td>DHEA-S</td>
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<td>DHEA + DHEA-S</td>
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<td>Cortisol (C)*</td>
<td>82530</td>
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<td>Cortisol (C)*</td>
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<td>Cortisol (C)*</td>
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<td>Total Cortisol</td>
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<td>Steroid hormone metabolites: 2-OH estradiol, 4-OH estradiol, 2-MeO estradiol, 4-MeO estradiol, 2-OH estrone, 4-OH estrone, 16α-OH estrone, 2-MeO estrone, 4-MeO estrone</td>
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<tr>
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<td>EIA</td>
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<td>EIA</td>
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<td>IGF-1 (Somatomedin C)</td>
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SALIVA 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

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.

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 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.

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: DS, Cx4
Cortisol Awakening Response Profile includes: DS, Cx6

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

Any tests offered as “single tests” can be added to any other test or profile at a discounted price. See p. 6-7.
BLOOD PROFILES - DRIED BLOOD SPOT & SERUM

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

Female Blood Profile I tests the primary male 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.

ESSENTIAL THYROID PROFILE

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. This profile 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

Full 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.
Consider for alopecia, anxiety, arthralgias, constipation, depression, fatigue, Hashimotos, hyperlipidemia, hypertension, infertility, menstrual disorders (DUB, amenorrhea), mood disorders, obesity, sleep disorders, and weight issues.

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.

Available in Dried Blood Spot
CardioMetabolic Profile includes: 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.

Any tests offered as “single tests” can be added to any other test or profile at a discounted price. See p. 6-7.
BLOOD SPOT AND SERUM PROFILES

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

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.

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 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.

ELEMENTS DRIED BLOOD SPOT PROFILE
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. 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, and is a convenient alternative to whole blood testing for lead.

Elements Dried Blood Spot Profile includes: Mercury, Cadmium, Lead, Zinc, Copper, Selenium, Magnesium

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

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 (e.g., lead) may be present in drinking water; and patients whose health issues could be a result of nutritional deficiencies or imbalances in essential elements.
NEUROTRANSMITTER PROFILE

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

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. This combined testing 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

- GABA
- Glutamate (Glu)
- Glycine (Gly)
- Dopamine (DA)
- Epinephrine (Epi)
- Histamine (HIST)
- Norepinephrine (NE)
- Serotonin (5-HT)
- Phenethylamine (PEA)
- DOPAC
- HVA
- 5-HIAA
- Normetanephrine (NMN)
- VMA

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

Add-On Options

- **Saliva Hormones** E2, Pg, T, DS, C
- **Urine Hormones** Dried Urine: E2, Pregnanediol, Allopregnanolone, Androstenedione, T, Epi-T, DHT, DHEA, 5a,3a-Androstanediol
- **Diurnal Cortisol** Dried Urine: Free Cortisol x 4, Free Cortisone x 4
- **Diurnal Cortisol & Melatonin** Dried Urine: Free Cortisol x 4, Free Cortisone x 4, Melatonin (MT6s) x 4
- **Diurnal Cortisol, Norepinephrine & Epinephrine** Dried Urine: Free Cortisol x 4, Free Cortisone x 4, NE x 4, Epi x 4
- **Diurnal Cortisol, Melatonin, Norepinephrine & Epinephrine** Dried Urine: Free Cortisol x 4, Free Cortisone x 4, Melatonin (MT6s) x 4, NE x 4, Epi x 4

Now Available!

Additional Tests for ZRT’s Neurotransmitter Profile

- Add-on saliva or dried urine hormones for a more complete assessment of HPA axis function, anxiety & depression, menstrual cycle disorders, PCOS, sympathetic nervous system dysregulation, low libido and appetite control.
- Add-on Diurnal Cortisol, Norepinephrine & Epinephrine for patients with severe anxiety issues, PTSD, stress, insomnia or chronic fatigue.
- Add-on Diurnal Cortisol & Melatonin for patients with chronic sleep issues.
NEUROTRANSMITTER CASCADE

Glutamate/GABA, Glycine & Histidine

Glutamate

Glutamine

GA

GS

Mg

Mn

Vit B6

Threonine

Histidine

Vit B6

HDC

Histidine

HNMT

N-methylhistamine

Cu

Vit B2

N-methylimidazole acetic acid

GABA

Glycine

Vit B6

GAD

MTHF

Vit B6

SERHMT

SAMe

Histamine

Serine

N-methylhistamine

Cu

Vit B2

MAO

6-OH-melatonin

Serotonin & Metabolites

Melatonin

4-HMT

(CYP 1A1, 1A2, 1B1)

SAMe

Acetyl CoA

Serotonin

5-HTP

TRPH

BH4

Fe

5-HIAA

MAO

AR

M6ST

6-sulfatoxy-melatonin

Catecholamines & Metabolites

Phenylalanine

AADC

Vit B6

PEA

PNMT

SAMe

N-methyl-PEA

Cu

Vit B2

MAO

Tyrosine

Phenyacetic acid

BH4

Fe

PHEH

Cu

Vit B2

MAO

DOPA

AADC

Vit B6

DOPAC

COMT

Mg

SAMe

HVA

Methylnorepinephrine

COMT

Mg

SAMe

Norepinephrine

SAMe

PNMT

MHPGAL

VMA

Epinephrine

COMT

Mg

SAMe

MN

Cofactors:

BH4

copper

Fe

iron

Mg

magnesium

Mn

manganese

MTFH

methyltetrahydrofolate

SAMe

5-adenosyl methionine

Enzymes:

AADC

aromatic L-amino acid decarboxylase

AANMT

arylamine N-methyltransferase

AD

aldehyde dehydrogenase

AR

aldehyde reductase

COMT

catechol-O-methyltransferase

DBH

dopamine beta hydroxylase

GA

glutaminase

GAD

glutamate decarboxylase

GS

glutamine synthetase

HDC

histidine decarboxylase

HIOMT

hydroxyindole-O-methyltransferase

HNMT

histamine N-methyltransferase

MAO

monoamine oxidase

M6H

melatonin 6 hydroxylase

MEST

melatonin 5 hydroxylase

PHEH

phenylalanine hydroxylase

PNMT

phenylethanolamine N-methyltransferase

SERHMT

serine hydroxymethyltransferase

THRA

threonine aldolase

TRPH

tryptophan hydroxylase

TYRH

tyrosine hydroxylase

Neurotransmitters & Metabolites:

HVA

homovanillic acid

NMN

normetanephrine

PEA

phenylethylamine

VMA

vanillylmandelic acid

5-HIAA

5-hydroxyindole 3-acetic acid
HORMONE METABOLITES PROFILES

Seven 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.

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

Consider as a baseline assessment for hormone replacement therapy.

ADVANCED
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.
# Dried Urine Profiles

## Urine Metabolites Profile Options

<table>
<thead>
<tr>
<th>Metabolite</th>
<th>ADRENAL</th>
<th>ESSENTIAL</th>
<th>ELITE</th>
<th>BASIC</th>
<th>ADVANCED</th>
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<td>Melatonin x4 (MT6s x4)</td>
<td>●</td>
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Creatinine is measured in all samples to correct results for urine dilution.
ELEMENTS DRIED URINE PROFILE
We are all, to varying degrees exposed to the elements iodine, bromine, selenium, arsenic, mercury, and cadmium. Iodine is an essential component of T3 and T4, so its deficiency has a serious impact on thyroid hormone synthesis, while bromine in excess competes with iodine in the thyroid. Selenium is a component of the selenoproteins, including the deiodinases that convert inactive T4 to active T3, and glutathione peroxidase, an important antioxidant which prevents free radical damage to tissues. 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.

Elements Dried Urine Profile includes:
Iodine, Bromine, Selenium, Arsenic, Mercury, Cadmium
Creatinine: Measured in all samples to correct for urine dilution

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. Urine is collected on filter strips at 4 time points throughout the day representative of the peaks and troughs of melatonin and cortisol production. The first urine void represents the 8 hours or so of overnight peak melatonin production, eliminating the need for middle of the night collection.

Sleep Balance Profile includes: MT6s x4, Free Cortisol x4, Free Cortisone x4
Creatinine: Measured in all samples to correct for urine dilution

Any tests offered as “single tests” can be added to any other test or profile at a discounted price. See p. 6-7.
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 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 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.

Any tests offered as “single tests” can be added to any other test or profile at a discounted price. See p. 6-7.
COMBINATION PROFILES

WEIGHT MANAGEMENT PROFILE
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

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 proactive weight control, and associated 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.

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 hs-CRP, 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.

COMPREHENSIVE ELEMENTS PROFILE
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 Elements Profile includes:
Urine: Cadmium, Mercury, Selenium, Arsenic, Iodine, Bromine
Creatinine: Measured in all samples to correct for urine dilution
Blood spot: Mercury, Cadmium, Lead, Zinc, Copper, Selenium, Magnesium

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

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 (e.g., lead) may be present in drinking water; and patients whose health issues could be a result of nutritional deficiencies or imbalances in essential elements.
**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

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.

**COMPREHENSIVE THYROID PROFILE**

This profile combines ZRT’s innovative Elements Dried Urine Profile (see Urine Profiles) in dried urine with thyroid testing in dried blood spot for a more comprehensive thyroid assessment.

Comprehensive Thyroid Profile includes: Urine: Iodine, Bromine, Selenium, Arsenic, Mercury, Cadmium, Creatinine; Blood spot: T4, Tgbn, TSH, fT3, fT4, TPOab

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.

**SKIN VITALITY PROFILE**

Skin is not only a major target of hormone action, it is also a site of local hormone synthesis, activation and metabolism. The range of hormones tested in the Skin Vitality Profile can help providers identify hormone deficiencies or excesses that are contributing to skin problems.

Skin Vitality Profile includes: Saliva: E2, E3, Pg, T, DS, Cx4; Blood spot: TSH, Vitamin D2/D3

Detection of hormone imbalances can lead to treatment of previously undiagnosed conditions such as a thyroid disorder or PCOS, or adjustment or initiation of hormone replacement therapy.

Consider for patients with thinning skin, wrinkling, dryness, oiliness, acne, hirsutism, hair loss, melasma, itching, myxedema, or slow wound healing.
COMPREHENSIVE TEST RESULTS

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. The ZRT test report consists of four detailed pages:

Page One:
- List of tests performed and results classified as Low (L), High (H), or Ok
- Current Therapies, Testosterone vs. age Graph, DHEA-S Graph, and Cortisol graph (if applicable).

Page Two:
- ZRT Laboratory Reference Ranges for the tests included in the report. Reference ranges are observed ranges based on collected laboratory data. Supplement type and dosage, where shown, are for health care provider information and are not recommendations for treatment.

Page Three:
- Bar graph of patient-reported symptoms grouped according to associated category of imbalance (not applicable if symptoms are not reported).

Page Four:
- 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.

TEST RESULTS - PAGE 1

<table>
<thead>
<tr>
<th>Test Name</th>
<th>04/09/2011</th>
<th>Current Units</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estradiol (saliva)</td>
<td>&lt;0.5 (1) L</td>
<td>pg/mL</td>
<td>(1) 0.5-1.7 Postmenopausal (optimal 1.3-1.7)</td>
</tr>
<tr>
<td></td>
<td>1.5 (2)</td>
<td></td>
<td>(2) 0.8-12 Estrogen Replacement (optimal 1.3-3.3)</td>
</tr>
<tr>
<td>Progesterone (saliva)</td>
<td>10 (1) L</td>
<td>pg/mL</td>
<td>(1) 12-100 Postmenopausal</td>
</tr>
<tr>
<td></td>
<td>100 (2)</td>
<td></td>
<td>(2) 30-300 Oral Progesterone (100-300 mg)</td>
</tr>
<tr>
<td>Ratio: Pg/E2 (saliva)</td>
<td>25 L</td>
<td>L</td>
<td>Optimal: 100-500 when E2 1.3-3.3 pg/mL</td>
</tr>
<tr>
<td>Testosterone (saliva)</td>
<td>5 L</td>
<td>pg/mL</td>
<td>16-55 (Age Dependent)</td>
</tr>
<tr>
<td>DHEAS (saliva)</td>
<td>2.2</td>
<td>ng/mL</td>
<td>2.2-3.6 (Age Dependent)</td>
</tr>
<tr>
<td>Cortisol (saliva)</td>
<td>3.5</td>
<td>ng/mL</td>
<td>3.7-9.5 (morning)</td>
</tr>
<tr>
<td></td>
<td>1.2</td>
<td>ng/mL</td>
<td>1.2-3.0 (noon)</td>
</tr>
<tr>
<td>Cortisol (saliva)</td>
<td>0.3 (1) L</td>
<td>1.4 (2) ng/mL</td>
<td>(1) 0.4-1.8 (night)</td>
</tr>
<tr>
<td></td>
<td>0.3</td>
<td>L</td>
<td>(2) 0.6-1.9 (evening)</td>
</tr>
<tr>
<td>Free T4 (blood spot)</td>
<td>0.8</td>
<td>ng/dL</td>
<td>0.6-10 (night)</td>
</tr>
<tr>
<td>Free T3 (blood spot)</td>
<td>2.2 L</td>
<td>2.5 mg/dL</td>
<td>2.5-5.6</td>
</tr>
<tr>
<td>TSH (blood spot)</td>
<td>6 H</td>
<td>1.3 μU/mL</td>
<td>0.5-5.0</td>
</tr>
<tr>
<td>TPO (blood spot)</td>
<td>350 H</td>
<td>100 μU/L</td>
<td>0-150 (70-150 borderline)</td>
</tr>
</tbody>
</table>

Therapies:
- [07/04/2012]: 15mg oral DHEA (compounded) (1 Days Last used); 200mg oral Progesterone (compounded) (1 Days Last used); 0.1mg oral Synthroid (T4) (Pharmaceutical) (1 Days Last used); 0.25mg topical Testosterone (compounded) (1 Days Last used); 0.05mg transdermal (Patch) Vivelle (estradiol) (Pharmaceutical) (1 Days Last used)
- [04/09/2011]: None

Hormones/markers tested

Tested levels - L indicates low, H indicates high

NOTE: With follow-up testing, report will show previous and current test results in dated columns to allow before and after comparisons and tracking of progress (if applicable).

Ranges - normal/expected range of each hormone/marker

NOTE: Numbers in parentheses correlate to optimal range

Patient provided supplementation information (hormone, dose, delivery, timing)

Graph of levels by age or time as a visual aid to above results and interpretation
TEST RESULTS - PAGE 2 (not pictured) ZRT Laboratory Reference Ranges
Reference ranges are observed ranges based on collected laboratory data. Supplement type and dosage, where included, are for health care provider information and are not recommendations for treatment.

TEST RESULTS - PAGE 3

COMPREHENSIVE TEST RESULTS

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

Severity of symptoms - clear circles indicate mild symptoms; solid circles indicate either moderate or severe symptoms - follow down to category of imbalance

Most common symptoms of imbalance

Gray bars show intensity of self reported symptoms

Color coded summation of symptoms; GREEN = not problematic, YELLOW = mildly problematic, RED = very problematic

Symptom weighting; 0-15% = not problematic; 15-25% = mildly problematic; > 25% = very problematic

Categories of imbalance

In the event that cortisol levels (high or low) differ on the bar graph of your test report than on page one, this is indicative of the weighted value of self-reported symptoms.

TEST RESULTS - PAGE 4 (not pictured) 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.
BILLING PRACTICES

PAYMENT OPTIONS

Bill Provider (Domestic and Canada)
- Provider distributes kits to patients
- Provider is billed twice monthly for any report that has been completed
- 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
- 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 Medical Mutual, 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 (Blood Spot) separately from standard test kits to satisfy Medicare Regulations. ZRT Laboratory will courtesy bill Medicare for all payment options.
GENERAL INFORMATION

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ZRT Laboratory
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Beaverton, OR 97008

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Toll-free: 1.866.600.1636
Fax: 503.466.1636
Email: info@zrtlab.com
Website: www.zrtlab.com

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.

CLINICAL RESEARCH & STUDY TESTING
Please contact us to inquire about research testing at 1.866.600.1636.
ZRT Laboratory is a CLIA certified diagnostic laboratory that supports health care professionals in health management through accurate, convenient and innovative lab testing.