Nordic Laboratories

PATIENT: XXXXXXXXXXXXXXXX
TEST NUMBER: T-NL-XXXXX (XXXXXXXXXX)
GENDER: XYZ
AGE: XX

COLLECTED: XX/XX/XXXX
RECEIVED: XX/XX/XXXX
TESTED: XX/XX/XXXX

TEST REF: TST-NL-XXXX
PRACTITIONER:
XXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXX

TEST NAME: LCMS

TEST NAME	RESULTS | 11/21/19	RANGE
Salivary Steroids & Other Analytes (LC-MS/MS)		
Estradiol	3.2 H	1.0-2.9 pg/mL Premeno-luteal
Estriol	1	<3.0 pg/mL Premenopausal Luteal
Estrone	10.4 H	3.2-7.9 pg/mL Premeno-luteal
Ethinyl Estradiol	<0.4	<0.4 pg/mL
Pregnenolone Sulfate	10	1-23 pg/mL
Progesterone	60 L	66-196 pg/mL Premeno-luteal
Ratio: Pg/E2 (Saliva LCMS)	19 L	23-196
Allopregnanolone	<15.0	<15 pg/mL
17OH-Progesterone	45 H	6-28 pg/mL
Androstenedione	110 H	36-93 pg/mL
Testosterone	40 H	7-22 pg/mL
DHT	30 H	<25 pg/mL
DHEA	113	77-287 pg/mL
DHEAS	6.9	0.8-8.0 ng/mL
7-keto DHEA	100	41-130 pg/mL
11-Deoxycortisol	52 H	12-48 pg/mL
Cortisol	6.7 H	2.5-6.2 ng/mL Morning
Cortisone	20	10.0-23.3 ng/mL Morning

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TEST NAME: LCMS

TEST NAME	RESULTS | 11/21/19	RANGE
Salivary Steroids & Other Analytes (LC-MS/MS)		
Corticosterone	60	11-66 pg/mL
Aldosterone	65 H	16-63 pg/mL
Melatonin	17	3-22 pg/mL
Anastrozole	<5	<5 pg/mL
Finasteride	265	>5 pg/mL Finasteride
Letrozole	<5	<5 pg/mL

<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.

Therapies

2.5 mg oral Finasteride (Proscar, Propecia) (Pharmaceutical)

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PATIENT: **XXXXXXXXXXXXXXXX**			TEST REF: **TST-NL-XXXX**
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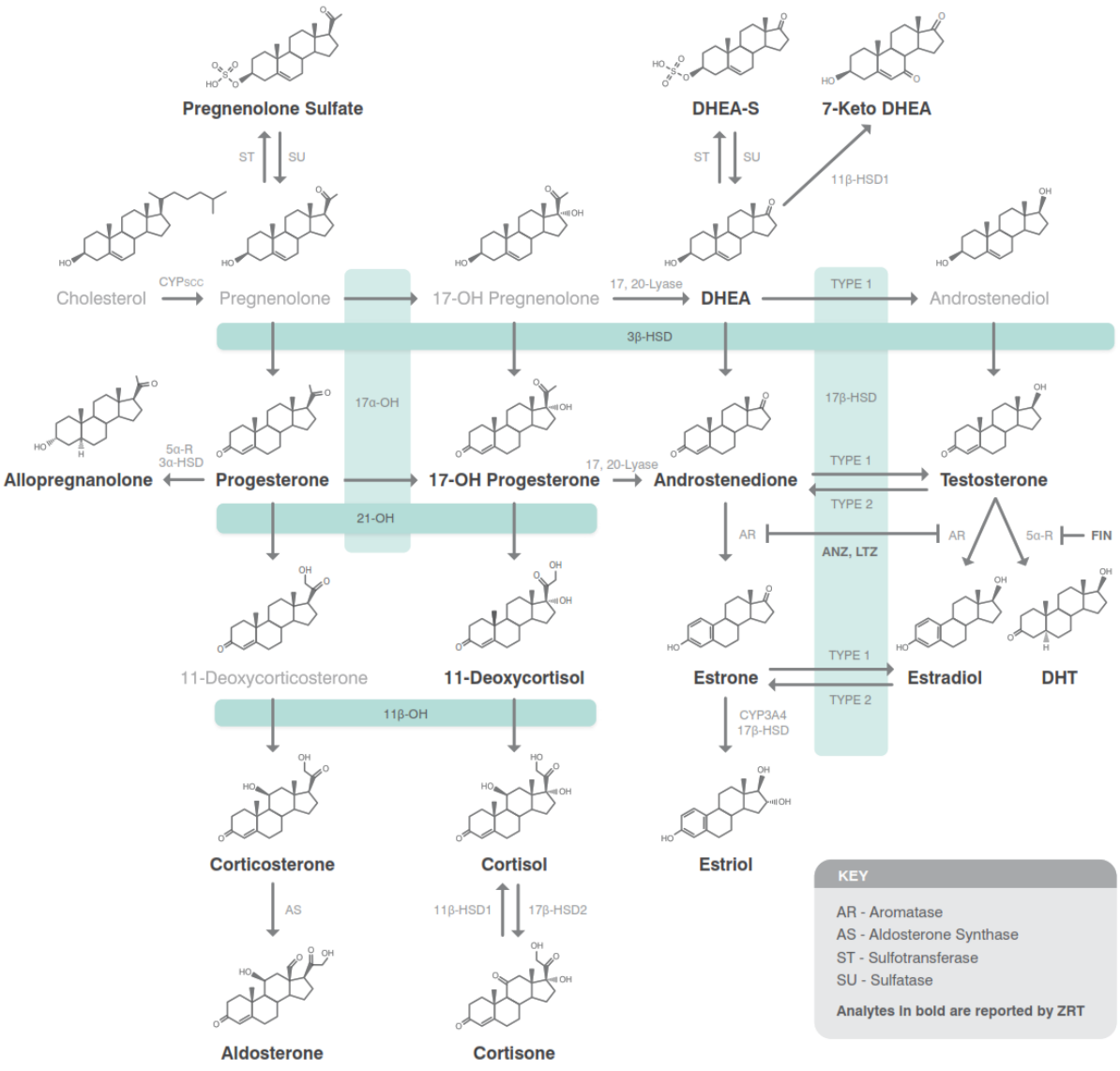
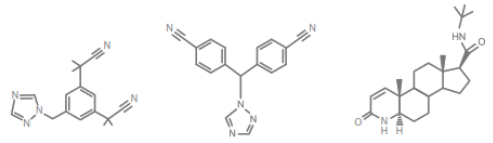
GENDER: XYZ	RECEIVED: XX/XX/XXXX		XXXXXXXXXXXXXXXXXXXX
AGE: XX	TESTED: XX/XX/XXXX		

TEST NAME: LCMS

Saliva Steroid Cascade



Steroid Synthesis Inhibitors

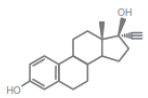


Anastrozole ANZ

Letrozole LTZ

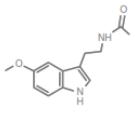
Finasteride FIN

Synthetic Contraceptive Estrogen



Ethinyl Estradiol

Melatonin



Mel

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TESTED: XX/XX/XXXX

TEST REF: TST-NL-XXXX
PRACTITIONER:
XXXXXXXXXXXXX
XXXXXXXXXXXXXXXXXXXX

TEST NAME: LCMS

TEST REPORT | Patient Reported Symptoms

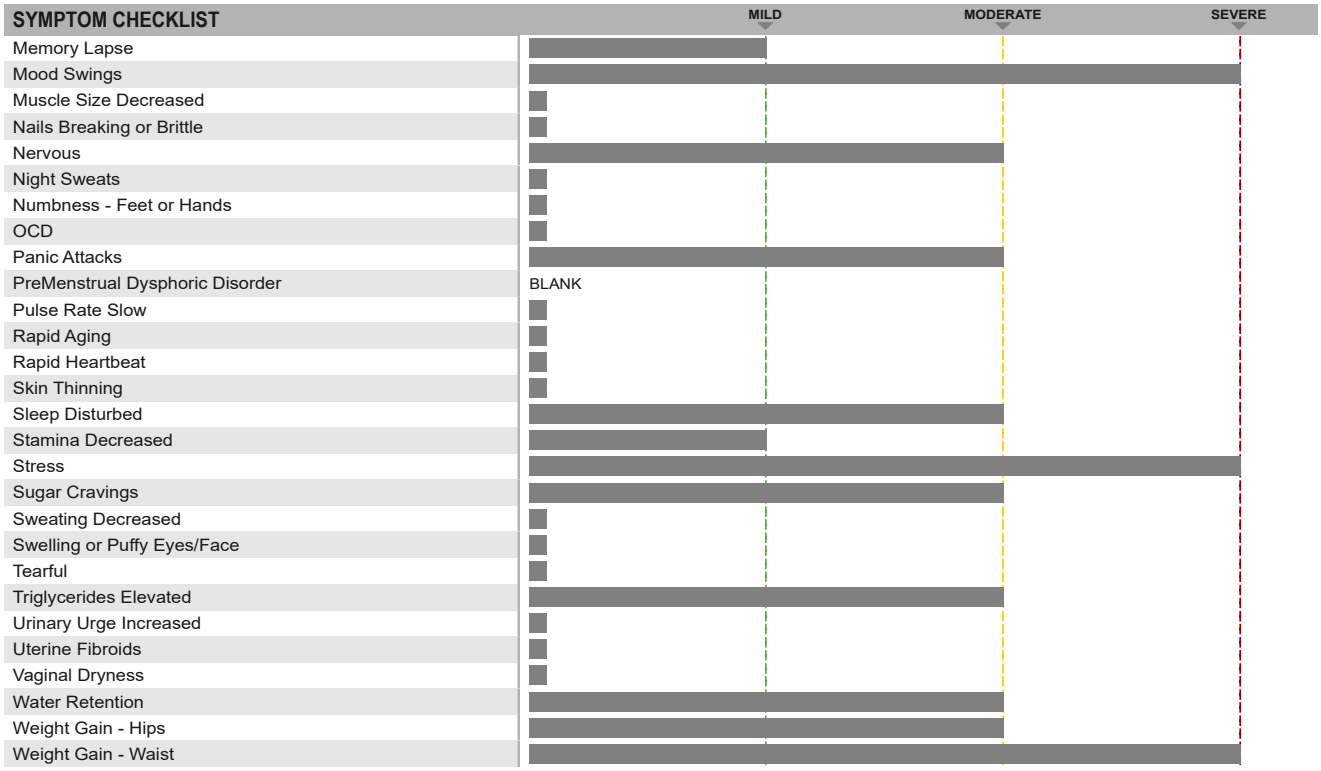
Disclaimer: Symptom Categories below show percent of symptoms self-reported by the patient compared to total available symptoms for each category.

SYMPTOM CATEGORIES	RESULTS | 11/21/19
Estrogen / Progesterone Deficiency	25%
Estrogen Dominance / Progesterone Deficiency	47%
Low Androgens (DHEA/Testosterone)	28%
High Androgens (DHEA/Testosterone)	69%
Low Cortisol	30%
High Cortisol	40%
Hypometabolism	23%
Metabolic Syndrome	76%

SYMPTOM CHECKLIST	MILD	MODERATE	SEVERE
Aches and Pains	■		
Acne	■	■	
ADD/ADHD	■		
Addictive Behaviors	■	■	
Allergies	■		
Anxious	■	■	
Autism Spectrum Disorder	■		
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	■	■	
Developmental Delays	■		
Eating Disorders	■	■	■
Fatigue - Evening	■		
Fatigue - Morning	■	■	
Fibromyalgia	■		
Foggy Thinking	■		
Goiter	■		
Hair - Dry or Brittle	■		
Hair - Increased Facial or Body	■	■	■
Hair - Scalp Loss	■	■	
Headaches	■	■	
Hearing Loss	■		
Heart Palpitations	■		
Hoarseness	■		
Hot Flashes	■		
Incontinence	■		
Infertility	■	■	■
Irritable	■	■	
Libido Decreased	■	■	■
Mania	■		

TEST NAME: LCMS

TEST REPORT | Patient Reported Symptoms *continued*



Lab Comments

Estradiol (E2) and estrone (E1) are higher than reference ranges for a premenopausal woman assuming that the saliva sample was collected during the luteal phase of the menstrual cycle (note: patient indicates irregular menstrual cycles). Symptoms are consistent with chronic high estrogens (estrogen dominance), which is usually associated low progesterone (Pg) relative to estradiol (i.e. low Pg/E2 ratio). For optimal effects of estradiol its level should be within mid-luteal ranges (about 1.5-3 pg/ml) and well balanced with progesterone, optimally with a Pg/E2 ratio of about 100-500. Consider means to lower the high estradiol with diet (more fiber, colored vegetables, less red meat, fewer empty carbohydrates), exercise, stress reduction, and natural progesterone. Progesterone helps regulate estradiol by increasing the levels and activity of enzymes that convert it to less active estrone and then to inert estrone sulfate. Progesterone at high physiological concentrations seen during the luteal phase of the menstrual cycle (10-30 mg), or used as progesterone therapy also down-regulate cellular estrogen receptors in target tissues such as the breasts and uterus, preventing estradiol from stimulating further cell hypertrophy and proliferation that occur during mid follicular phase/ ovulation, and in women approaching menopause with excessive estradiol synthesis and luteal insufficiency (low progesterone).

Progesterone (Pg) is lower than luteal range and is not well balanced with estradiol (low Pg/E2). Low Pg is consistent with symptoms of estrogen dominance. The downstream Pg metabolite allopregnanolone (AlloP) is very low (less than detectable range). AlloP is a potent neuroactive steroid in the brain that amplifies the anxiolytic (calming) actions of GABA on the GABAergic neurons, which helps balance the anxiogenic (stimulating) actions of excessive levels of estrogens. Allopregnanolone is created from progesterone through the actions of 5-alpha reductase (5aR) and 3-alpha hydroxysteroid dehydrogenase (3aHSD), which convert Pg to 5-hydroxyprogesterone (5OHPg) and then to AlloP. This individual reports use of Finasteride, a potent synthetic inhibitor of 5aR that blocks conversion of T to DHT, and Pg to 5OHP, a precursor to AlloP. Very low AlloP is likely the result of Finasteride therapy to suppress symptoms of androgen excess, as self-reported. While Finasteride has been shown to be effective for treating hair loss and hirsutism caused by high testosterone/DHT, it can cause adverse side effects such as anxiety and depression, symptoms commonly associated with low AlloP.

Testosterone (T), is higher than reference range for a premenopausal woman. Precursors for testosterone, 17-hydroxyprogesterone (17OHP) and androstenedione (Adione) are also higher than range. However, dihydrotestosterone (DHT), the downstream metabolite of T and responsible for many of the final actions of androgens at the cellular level, is lower than detectable range, indicating low 5 alpha reductase (5aR) activity. This individual indicates recent use of Finasteride, a 5aR inhibitor often used by women with PCOS and symptoms of androgen excess such as scalp hair loss, acne, and excessive facial/body hair. By inhibiting 5aR this often results in accumulation of hormones upstream of the inhibitor, which would include T, Adione, and 17OHP. High levels of these hormones in combination with high estrogens, low progesterone,

TEST NAME: LCMS

TEST REPORT | Comments *continued*

irregular menstrual cycles, and symptoms of androgen excess (e.g. loss of scalp hair, increased facial/body hair, and/or acne) strongly suggest Polycystic Ovarian Syndrome (PCOS), a condition found to occur in approximately 8-10% of premenopausal women. PCOS is closely associated with excessive weight gain, poor diet consisting of excessive carbohydrate consumption, and insulin resistance. Various natural and synthetic inhibitors are used to lower the androgenic burden by inhibiting T synthesis (synthetic progestins, LH antagonists) or DHT synthesis by inhibition of 5aR (Finasteride, Saw Palmetto, natural progesterone). While all are effective for reducing DHT, if inhibition is excessive it could lead to very low levels of DHT's downstream metabolite 3a5a-androstanediol (Adiol), a neuroactive steroid with beneficial actions on the gabaergic and dopaminergic receptors in the brain. Low Adiol may exacerbate symptoms associated with low dopamine, which include food craving, low stamina, lack of focus, moodiness, forgetfulness, fatigue, apathy, and feelings of depression and sadness. If these adverse symptoms have become more problematic with use of Finasteride consider reducing dosage or consider other more natural means to block excessive formation of DHT (e.g. natural progesterone, treatment for insulin resistance if problematic).

The adrenal androgen precursors DHEA, DHEA-sulfate (DHEA-S), and 7-keto DHEA are within reference ranges for a premenopausal female. DHEA and 7-Keto DHEA are present in saliva in approximately equal amounts. Supplementation with DHEA raises levels of DHEA and downstream metabolites such as androstenedione, testosterone, and estrogens estrone and estradiol. In contrast, 7-keto DHEA, while it has beneficial anabolic effects and amplifies the actions of thyroid hormones, does not metabolize to downstream androgens or estrogens, like DHEA. Supplementation with 7-keto DHEA raises only its levels in saliva, resulting in a very high 7-keto DHEA/DHEA ratio. Supplementation with DHEA results in a very high DHEA/7-keto DHEA ratio and is useful for identifying individuals that may knowingly or unknowingly be using supplements that contain DHEA.

Cortisol is slightly elevated and its upstream precursors 11-deoxycortisol and 17-OH progesterone are also within the upper quadrant and higher than the reference ranges, respectively. Higher levels of these adrenal cortisol precursors and cortisol, in combination with high androgens are a hallmark of PCOS. Elevated cortisol is associated with insulin resistance, high insulin and hyperglycemia, and the etiology of PCOS. Stress reduction, removal of inflammatory foods, and natural progesterone can help counter the negative effects of chronic high cortisol. High cortisol likely contributes to self-reported sleep disturbances.

Aldosterone and its precursor corticosterone are higher than reference ranges, consistent with self-reported high blood pressure. Aldosterone is produced in the outer most zone of the adrenal gland. It regulates the body's levels of sodium and potassium through its actions on the kidney to increase sodium reabsorption and increase potassium excretion. High aldosterone (hyperaldosteronism) occurs frequently in women with PCOS and insulin resistance. High aldosterone is correlated directly with higher C-reactive protein, thickening of the intima-media of the carotid artery, lower HDL-cholesterol, and lower serum potassium, all of which increase lifetime risk for cardiovascular disease. Natural therapies to treat insulin resistance (weight control, diet, exercise, stress reduction, etc.), or synthetic drugs (e.g. Spironolactone, calcium channel blockers) to treat the more immediate deleterious effects of high aldosterone and low potassium should be discussed with a health care practitioner.

Melatonin in the first morning saliva sample is within expected reference range. This test only measures the first morning saliva, which if collected on awakening should be within reference range, as is not meant to evaluate melatonin at night before bed. However, if early nighttime melatonin is low this may aggravate being able to fall asleep. Melatonin is an antioxidant and supplementation may help with better sleep patterns and help lower cortisol, which at high levels contributes to insulin resistance.