

Patient: **SAMPLE**
PATIENT

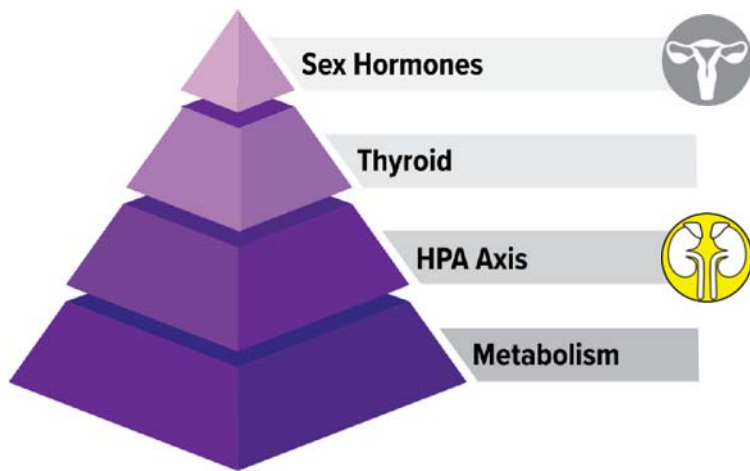
DOB:

Sex:

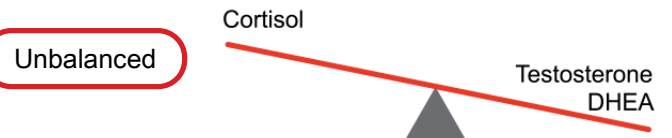
MRN:

4122 Women's Health+ - Saliva, Urine

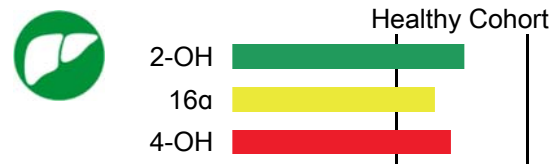
Results Overview



Anabolic/Catabolic Balance



Estrogen Metabolism



Functional Imbalance Scores

Key **< 2** : Low Need for Support **2-3** : Optional Need for Support **4-6** : Moderate Need for Support **7-10** : High Need for Support

Need For HPA Axis Support

HPA AXIS

4

Cortisol Curve ▼
DHEA:Cortisol ▲
Morning Cortisol ●
DHEA ●

- Stress Reduction
- Mindfulness Training
- HRV Biofeedback
- Breathwork Training
- Exercise/Yoga/Tai Chi
- Herbal Adaptogens
- Lower Blood Sugar
- B-Vitamins
- Phosphoserine
- Glandulars

Need For Sex Hormone Support

SEX HORMONES

2

Oestradiol ▼
Progesterone ●
Estrone ●
Testosterone ●

- Address Thyroid Imbalance
- Address HPA Axis
- Phytoestrogens (for estrogen support)
- Phytoandrogens (for testosterone support)
- Consider Glandulars
- Consider Hormone Precursors
- Consider BHRT

Need For Detoxification Support

ESTROGEN METABOLISM

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2-OH-E1/E2 ●
4-OH-E1/E2 ●
2/16 Ratio ●
Methylation Activity ●

- Methylation Support: B-Vitamins, Mg, Betaine
- Cruciferous vegetables, berries, rosemary
- Soy isoflavones, DIM, I3C
- Bioflavonoids, Glutathione
- Reduce sugar, stress, environmental toxicity
- Reduce adiposity
- Physical activity

Therapeutic Support Options

Nutrient Need Overview													
Nutrient Need											DRI	Suggested Recommendations	Provider Recommendations
0	1	2	3	4	5	6	7	8	9	10			
Antioxidants													
Glutathione													
B-Vitamins													
Thiamin - B1											1.1 mg	25 mg	
Riboflavin - B2											1.1 mg	10 mg	
Niacin - B3											14 mg	30 mg	
Pyridoxine - B6											1.5 mg	10 mg	
Biotin - B7											30 mcg	200 mcg	
Folate - B9											400 mcg	800 mcg	
Cobalamin - B12											2.4 mcg	100 mcg	
Minerals													
Magnesium											320 mg	600 mg	
Manganese											1.8 mg	3.0 mg	
Zinc											8 mg	20 mg	
GI Support													
Digestive Support/Enzymes												0 IU	
Microbiome Support/Probiotics												10 billion CFU	

Recommendations for age and gender-specific supplementation are set by comparing levels of nutrient functional need to optimal levels as described in the peer-reviewed literature. They are provided as guidance for short-term support of nutritional deficiencies only.

The Nutrient Need Overview is provided at the request of the ordering practitioner. Any application of it as a therapeutic intervention is to be determined by the ordering practitioner.



Antioxidant Needs

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- ## KEY

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Interpretation At-A-Glance

B-Vitamin Needs

Thiamin - B1

6

- B1 is a required cofactor for enzymes involved in energy production from food, and for the synthesis of ATP, GTP, DNA, RNA and NADPH.
- Low B1 can result from chronic alcoholism, diuretics, digoxin, oral contraceptives and HRT, or large amounts of tea & coffee (contain anti-B1 factors).
- B1 deficiency may lead to dry beriberi (e.g., neuropathy, muscle weakness), wet beriberi (e.g., cardiac problems, edema), encephalopathy or dementia.
- Food sources include lentils, whole grains, wheat germ, Brazil nuts, peas, organ meats, brewer's yeast, blackstrap molasses, spinach, milk & eggs.

Riboflavin - B2

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- B2 is a key component of enzymes involved in antioxidant function, energy production, detoxification, methionine metabolism and vitamin activation.
- Low B2 may result from chronic alcoholism, some anti-psychotic medications, oral contraceptives, tricyclic antidepressants, quinacrine or adriamycin.
- B2 deficiency may result in oxidative stress, mitochondrial dysfunction, low uric acid, low B3 or B6, high homocysteine, anemia or oral & throat inflammation.
- Food sources include milk, cheese, eggs, whole grains, beef, chicken, wheat germ, fish, broccoli, asparagus, spinach, mushrooms and almonds.

Niacin - B3

5

- B3 is used to form NAD and NADP, involved in energy production from food, fatty acid & cholesterol synthesis, cell signaling, DNA repair & cell differentiation.
- Low B3 may result from deficiencies of tryptophan (B3 precursor), B6, B2 or Fe (cofactors in B3 production), or from long-term isoniazid or oral contraceptive use.
- B3 deficiency may result in pellagra (dermatitis, diarrhea, dementia), neurologic symptoms (e.g., depression, memory loss), bright red tongue or fatigue.
- Food sources include poultry, beef, organ meats, fish, whole grains, peanuts, seeds, lentils, brewer's yeast and lima beans.

Pyridoxine - B6

4

- B6 (as P5P) is a cofactor for enzymes involved in glycogenolysis & gluconeogenesis, and synthesis of neurotransmitters, heme, B3, RBCs and nucleic acids.
- Low B6 may result from chronic alcoholism, long-term diuretics, estrogens (oral contraceptives and HRT), anti-TB meds, penicillamine, L-DOPA or digoxin.
- B6 deficiency may result in neurologic symptoms (e.g., irritability, depression, seizures), oral inflammation, impaired immunity or increased homocysteine.
- Food sources include poultry, beef, beef liver, fish, whole grains, wheat germ, soybean, lentils, nuts & seeds, potato, spinach and carrots.

Biotin - B7

7

- Biotin is a cofactor for enzymes involved in functions such as fatty acid synthesis, mitochondrial FA oxidation, gluconeogenesis and DNA replication & transcription.
- Deficiency may result from certain inborn errors, chronic intake of raw egg whites, long-term TPN, anticonvulsants, high-dose B5, sulfa drugs & other antibiotics.
- Low levels may result in neurologic symptoms (e.g., paresthesias, depression), hair loss, scaly rash on face or genitals or impaired immunity.
- Food sources include yeast, whole grains, wheat germ, eggs, cheese, liver, meats, fish, wheat, nuts & seeds, avocado, raspberries, sweet potato and cauliflower.

Folate - B9

6

- Folate plays a key role in coenzymes involved in DNA and SAMe synthesis, methylation, nucleic acids & amino acid metabolism and RBC production.
- Low folate may result from alcoholism, high-dose NSAIDs, diabetic meds, H2 blockers, some diuretics and anti-convulsants, SSRIs, methotrexate, trimethoprim, pyrimethamine, triamterene, sulfasalazine or cholestyramine.
- Folate deficiency can result in anemia, fatigue, low methionine, increased homocysteine, impaired immunity, heart disease, birth defects and CA risk.
- Food sources include fortified grains, green vegetables, beans & legumes.

Cobalamin - B12

3

- B12 plays important roles in energy production from fats & proteins, methylation, synthesis of hemoglobin & RBCs, and maintenance of nerve cells, DNA & RNA.
- Low B12 may result from alcoholism, malabsorption, hypochlorhydria (e.g., from atrophic gastritis, H. pylori infection, pernicious anemia, H2 blockers, PPIs), vegan diets, diabetic meds, cholestyramine, chloramphenicol, neomycin or colchicine.
- B12 deficiency can lead to anemia, fatigue, neurologic symptoms (e.g., paresthesias, memory loss, depression, dementia), methylation defects or chromosome breaks.
- Food sources include shellfish, red meat, poultry, fish, eggs, milk and cheese.

KEY



Function of Nutrient



Cause of Deficiency



Complications of Deficiency



Food Sources of Nutrient

Mineral Needs

5

- 0

- 5

- ## KEY

- Function of Nutrient ● Cause of Deficiency ● Complications of Deficiency ● Food Sources of Nutrient

Interpretation At-A-Glance

Microbiome & Digestive Support

Microbiome Support/Probiotics

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- Probiotics have many functions. These include: production of some B vitamins and vitamin K; enhance digestion & absorption; decrease severity of diarrheal illness; modulate of immune function & intestinal permeability.
- Alterations of gastrointestinal microflora may result from C-section delivery, antibiotic use, improved sanitation, decreased consumption of fermented foods and use of certain drugs.
- Some of the diseases associated with microflora imbalances include: IBS, IBD, fibromyalgia, chronic fatigue syndrome, obesity, atopic illness, colic and cancer.
- Food sources rich in probiotics are yogurt, kefir and fermented foods.

Digestive Support/Enzymes

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- Pancreatic enzymes are secreted by the exocrine glands of the pancreas and include protease/peptidase, lipase and amylase.
- Pancreatic exocrine insufficiency may be primary or secondary in nature. Any indication of insufficiency warrants further evaluation for underlying cause (i.e., celiac disease, small intestine villous atrophy, small bowel bacterial overgrowth).
- A high functional need for digestive enzymes suggests that there is an impairment related to digestive capacity.
- Determining the strength of the pancreatic enzyme support depends on the degree of functional impairment. Supplement potency is based on the lipase units present in both prescriptive and non-prescriptive agents.

Functional Imbalances

Mitochondrial Dysfunction

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- Mitochondria are a primary site of generation of reactive oxygen species. Oxidative damage is considered an important factor in decline of physiologic function that occurs with aging and stress.
- Mitochondrial defects have been identified in cardiovascular disease, fatigue syndromes, neurologic disorders such as Parkinson's and Alzheimer's disease, as well as a variety of genetic conditions. Common nutritional deficiencies can impair mitochondrial efficiency.

Need for Methylation

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- Methylation is an enzymatic process that is critical for both synthesis and inactivation. DNA, estrogen and neurotransmitter metabolism are all dependent on appropriate methylation activity.
- B vitamins and other nutrients (methionine, magnesium, selenium) functionally support catechol-O-methyltransferase (COMT), the enzyme responsible for methylation.

Toxic Exposure

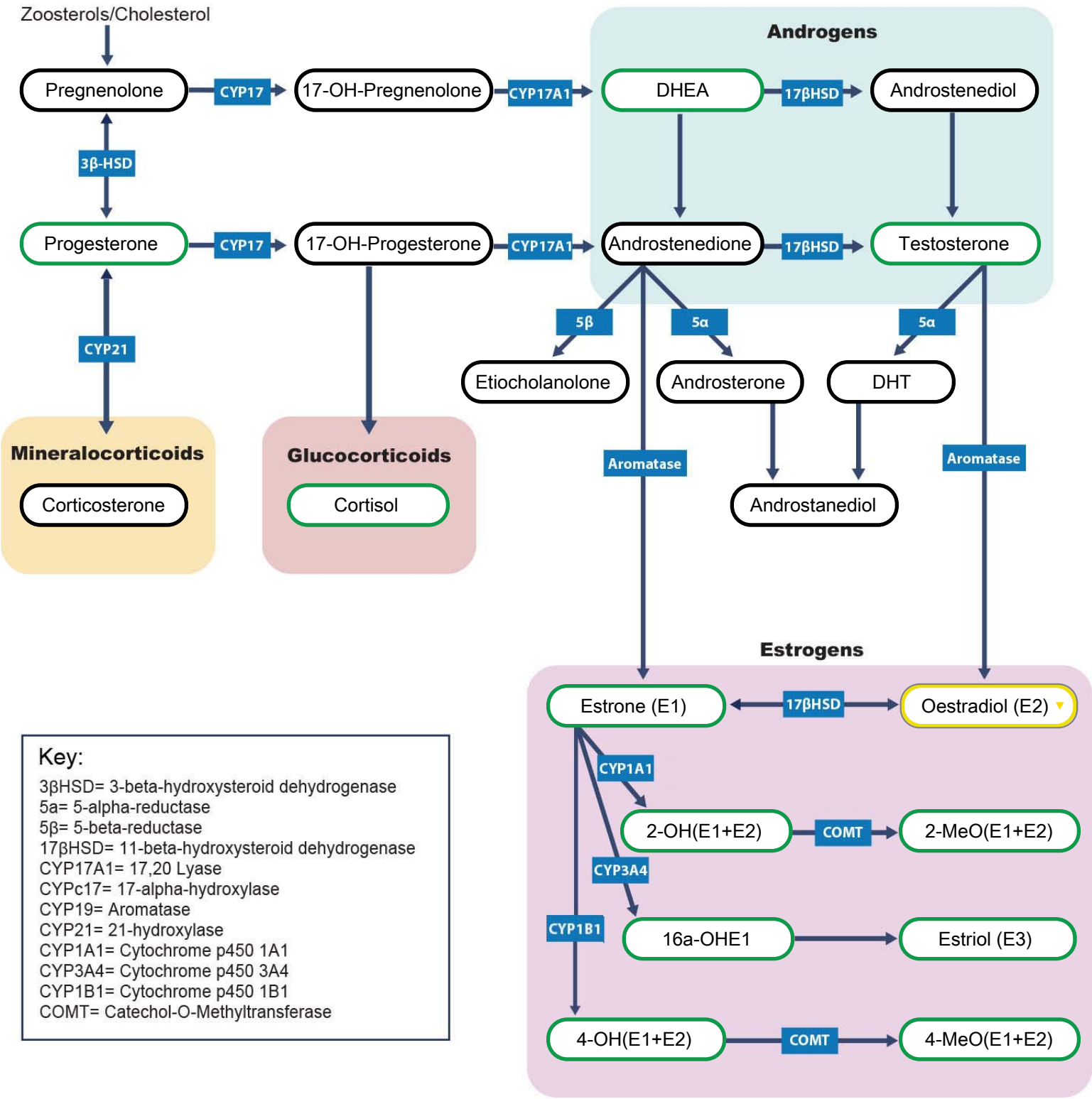
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- Methyl tert-Butyl Ether (MTBE) is a common gasoline additive used to increase octane ratings, and has been found to contaminate ground water supplies where gasoline is stored. Inhalation of MTBE may cause nose and throat irritation, as well as headaches, nausea, dizziness and mental confusion. Animal studies suggest that drinking MTBE may cause gastrointestinal irritation, liver and kidney damage and nervous system effects.
- Styrene is classified by the US EPA as a "potential human carcinogen," and is found widely distributed in commercial products such as rubber, plastic, insulation, fiberglass, pipes, food containers and carpet backing.
- Levels of these toxic substances should be examined within the context of the body's functional capacity for methylation and need for glutathione.

KEY

- Function of Nutrient
- Cause of Deficiency
- Complications of Deficiency
- Food Sources of Nutrient

Steroidogenic Pathway



The results shown on pages 1 and 7 default to salivary results. If no salivary results are available, urine results are used.

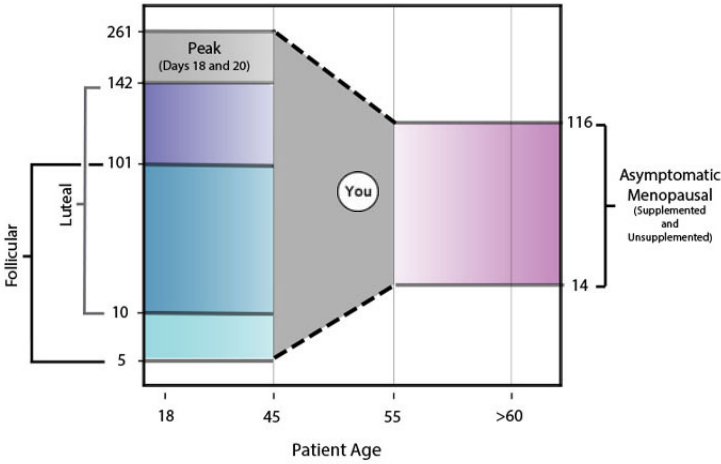
Methodology: EIA, LIA

Salivary Sex Hormones

Progesterone

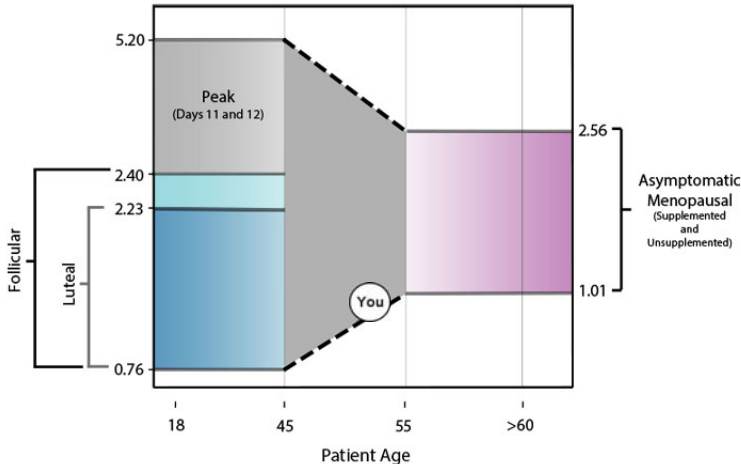
Estrogens

Progesterone



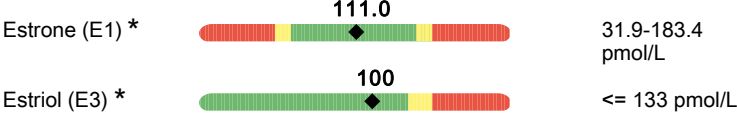
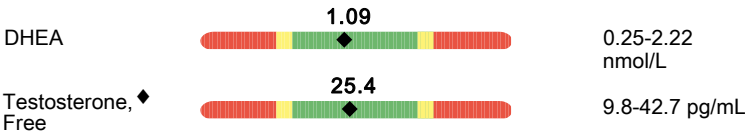
Progesterone 81 See Chart Below

Oestradiol (E2)



Oestradiol (E2) 0.98 See Chart Below

Androgens



*Reference ranges for Estrone and Estriol are based on menopausal patients.

Reference Range Information

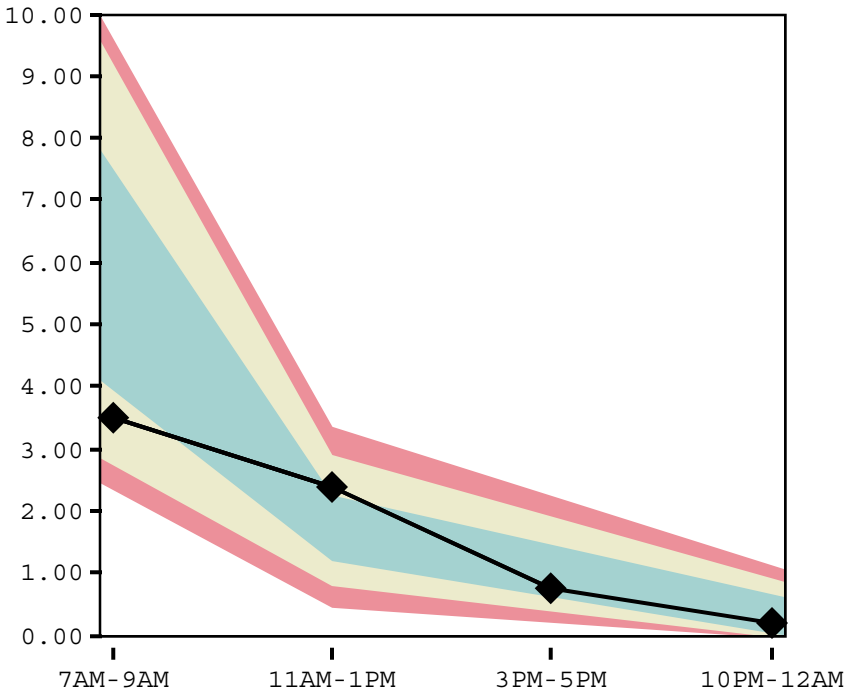
Saliva Analyte	Luteal	Follicular	Menopausal	Male	Patient Result
Estrone (pmol/L)	N/A	N/A	31.9 - 183.4	N/A	111.0
Oestradiol (pg/mL)	0.76 - 2.23	0.76 - 2.40	1.01 - 2.56	0.84 - 2.02	0.98
Estriol (pmol/L)	N/A	N/A	<=133	N/A	100
Progesterone (pg/mL)	10 - 142	5 - 101	14 - 116	10 - 88	81
Testosterone, Free (pg/mL)	9.8 - 42.7	9.8 - 42.7	9.8 - 42.7	31.7 - 147.8	25.4
DHEA (nmol/L)	0.25 - 2.22	0.25 - 2.22	0.25 - 2.22	0.25 - 2.22	1.09

These reference ranges are based on luteal premenopausal samples. If patient is menopausal, refer to the chart above to determine the appropriate clinical ranges. Each individual is unique and evaluation of hormone status should be within the context of the patient's clinical picture.

Methodology: EIA

HPA Axis

Diurnal Cortisol Curve



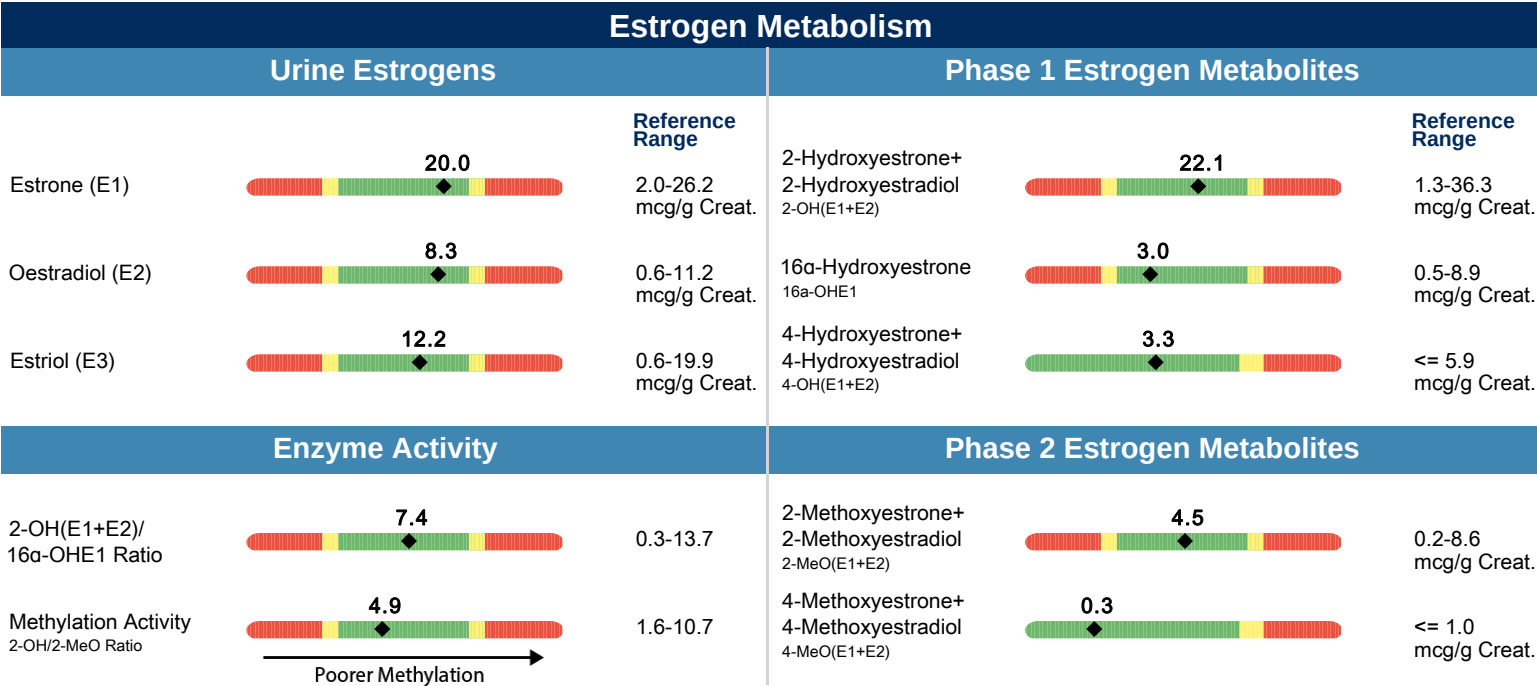
Cortisol, Free (Salivary)			Androgens		
		Reference Range			Reference Range
7AM-9AM Cortisol ♦	3.50	2.68-9.30 nmol/L	DHEA	1.09	0.25-2.22 nmol/L
11AM-1PM Cortisol ♦	2.37	0.75-2.93 nmol/L	DHEA:Cortisol Ratio	0.31	0.05-0.32
3PM-5PM Cortisol ♦	0.74	0.36-1.88 nmol/L			
10PM-12AM Cortisol ♦	0.19	<= 0.94 nmol/L			

Results

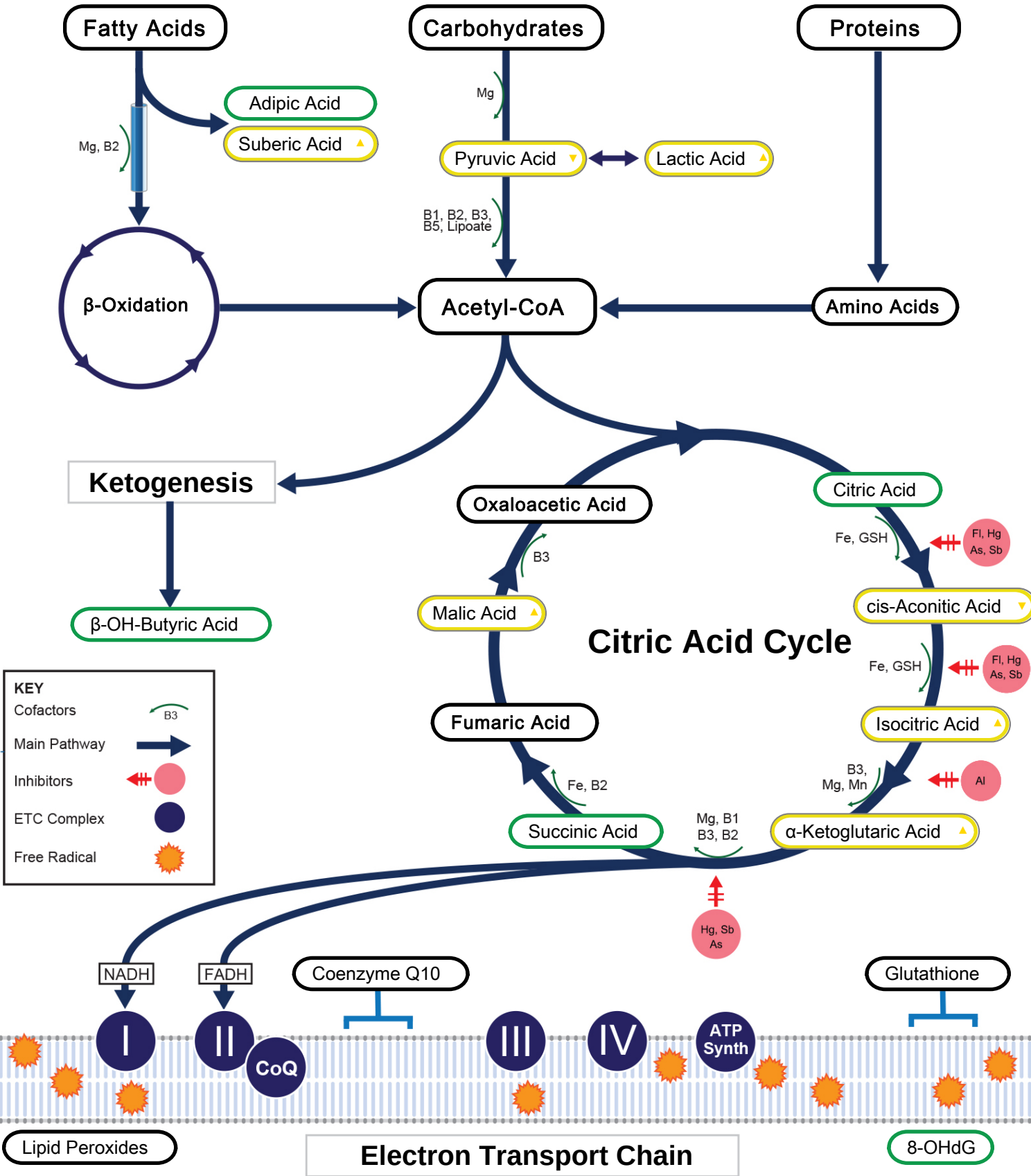
Cortisol, Free (Salivary)	Morning Cortisol 7AM-9AM**	Midday Cortisol 11AM-1PM**	Afternoon Cortisol 3PM-5PM**	Evening Cortisol 10PM-12AM**
Patient Result (nmol/L) >>	3.50	2.37	0.74	0.19
Reference Range (nmol/L) **Based on Collection Times	2.68-9.30	0.75-2.93	0.36-1.88	<=0.94
Actual Collection Time	7:30AM	NG*	NG*	NG*

*NG = Not Given

Methodology: LC/MS/MS



Oxidative Stress & Mitochondrial Dysfunction



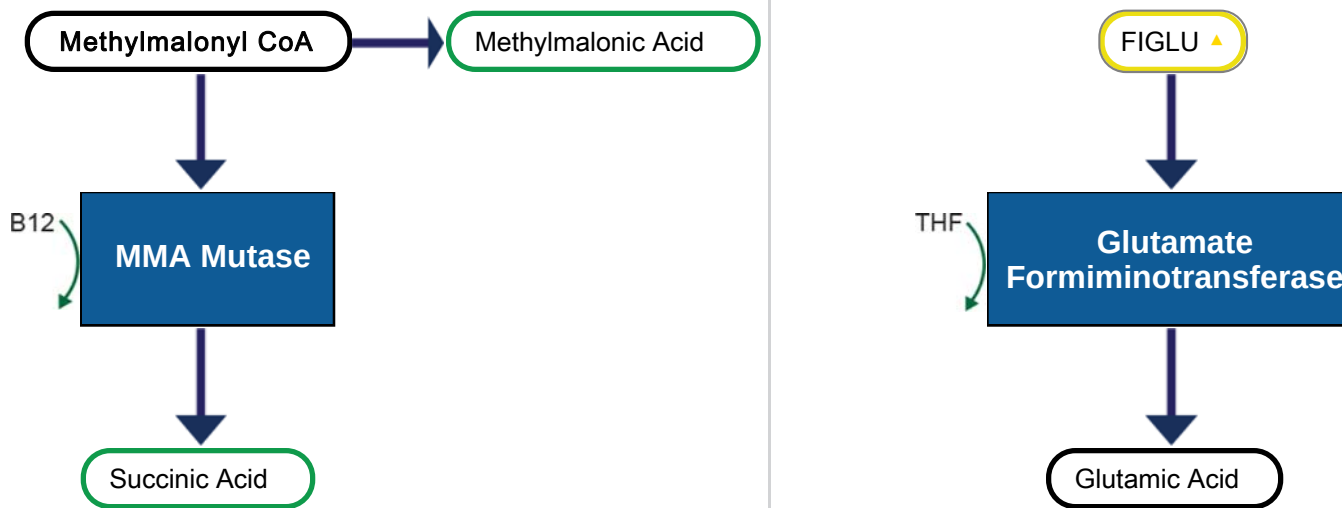
All biomarkers reported in mmol/mol creatinine unless otherwise noted.

Organic Acids			
Malabsorption & Dysbiosis Markers		Vitamin Markers	
Malabsorption Markers	Reference Range	Branched-Chain Catabolites (B1, B2, B3, ALA)	Reference Range
Indoleacetic Acid	0.9	α-Ketoadipic Acid	1.3
Phenylacetic Acid	0.05	α-Ketoisovaleric Acid	0.61
Dysbiosis Markers		α-Ketoisocaproic Acid	0.54
Dihydroxyphenylpropionic Acid (DHPPA)	2.1	α-Keto-β-Methylvaleric Acid	0.5
3-Hydroxyphenylacetic Acid	2.8	Glutaric Acid	0.29
4-Hydroxyphenylacetic Acid	21	Isovalerylglycine	1.5
Benzoic Acid	0.03	Methylation Markers (Folate, B12)	
Hippuric Acid	316	Formiminoglutamic Acid (FIGlu)	1.2
Yeast / Fungal Dysbiosis Markers		Methylmalonic Acid	0.6
D-Arabinitol	9	Biotin Markers	
Citramalic Acid	<dl	3-Hydroxypropionic Acid	12
Tartaric Acid	<dl	3-Hydroxyisovaleric Acid	18
Cellular Energy & Mitochondrial Markers		Neurotransmitter Metabolites	
Fatty Acid Metabolism	Reference Range	Kynurenine Markers (Vitamin B6)	Reference Range
Adipic Acid	1.4	Kynurenic Acid	5.6
Suberic Acid	1.3	Quinolinic Acid	<dl
Carbohydrate Metabolism		Kynurenic / Quinolinic Ratio	NR
Pyruvic Acid	10	Xanthurenic Acid	0.34
Lactic Acid	17.2	Catecholamine Markers	
α-Hydroxybutyric Acid	0.68	Homovanillic Acid	2.5
β-OH-Butyric Acid	0.8	Vanilmandelic Acid	1.9
β-OH-β-Methylglutaric Acid	4	3-Methyl-4-OH-phenylglycol	0.19
Energy Metabolism		Serotonin Markers	
Citric Acid	293	5-OH-indoleacetic Acid	7.4
cis-Aconitic Acid	13	Toxin & Detoxification Markers	
Isocitric Acid	55	Pyroglutamic Acid	30
α-Ketoglutaric Acid	48	α-Ketophenylacetic Acid (from Styrene)	0.42
Succinic Acid	1.2	α-Hydroxyisobutyric Acid (from MTBE)	5.7
Malic Acid	1.6	Orotic Acid	0.45
Methodology: GCMS, LC/MS/MS, Alkaline Picrate, Colorimetric		Organic Acid Reference Ranges are Age Specific	

Organic Acids					
Oxalate Markers		Reference Range	Creatinine Concentration		Reference Range
Glyceric Acid		3.5-16.4	Urine Creatinine		3.1-19.5 mmol/L
Glycolic Acid		<= 67			
Oxalic Acid		<= 78			
All biomarkers reported in mmol/mol creatinine.					

Oxidative Damage		Reference Range
8-OHdG (urine)		≤ 15 mcg/g Creat.
The Oxidative Stress reference ranges are based on an adult population.		

Methylation Markers



The diagram illustrates the metabolic pathway of branched-chain amino acids. On the left, three amino acids are listed in rounded rectangles: Valine, Leucine, and Isoleucine. Arrows from each point to their respective α-keto acids in yellow-outlined rectangles: α-Ketoisovaleric Acid (with a yellow triangle icon), α-Ketoisocaproic Acid (with a yellow triangle icon), and α-Keto-β-Methylvaleric Acid (with a green circle icon). Arrows from the first two α-keto acids point to a large blue box labeled "Branched Chain a-Ketoacid Dehydrogenase". A green curved arrow next to this box points to the text "B1,B2,B3, B5, Lipoate". From the bottom of the blue box, two arrows point to the "Krebs Cycle", labeled "Acetyl-CoA" and "Succinic Acid".



Commentary

For more information regarding Endo+ clinical interpretation, please refer to the Endo+ Support Guide at www.gdx.net/hormoneguide

For more information regarding Organic Acids clinical interpretation, please refer to the Organic Acids Support Guide at www.gdx.net/nutrevalguide

Testing performed by Genova Diagnostics, Inc. 63 Zillico St., Asheville, NC 28801-0174

The performance characteristics of all assays have been verified by Genova Diagnostics, Inc. Unless otherwise noted with ♦, the assay has not been cleared by the U.S. Food and Drug Administration.

<dl = Less than detection limit; >ul = greater than upper linearity limit; NR = Not Reportable

Cortisol reference ranges are based on samples collected over one day during the following time periods (+/- 2hrs):

- #1: 7AM - 9AM
- #2: 11AM - 1PM
- #3: 3PM - 5PM
- #4: 10PM - 12AM

Results for samples collected outside the recommended time period should be interpreted with caution as the stated reference range may not apply.

The **Reference Range** is a statistical interval representing 95% or 2 Standard Deviations (2 S.D.) of the reference range population. One Standard Deviation (1 S.D.) is a statistical interval representing ~68% of the reference population. Values between 1 and 2 S.D. are not necessarily abnormal. Clinical Correlation is suggested.

