

Testing

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Testing

- Testing during perimenopause is not great as hormones are all over the place so can treat by “symptoms”
- Debate over testing before or only once on BHRT
- And within several months to check levels
- Or when they are feeling really great
- Or not responding
- Must track thyroid as giving ERT can lower thyroid signaling = this is critical
- Track post prandial insulin as high insulin can occupy sex steroid hormones and become “competitive inhibitor”
- Track cortisol as when high (or low) can occupy sex steroid hormones and become “competitive inhibitor”

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Always must also run blood

- SHBG
- FSH
- RBCs like zinc
- Hormone ranges are not ideal they are norms
- There is a debate if they reflect tissue levels or not
- If run serum for hormones: estrone lower than estradiol, progesterone over 4 ng/dL,
- Total and Free T

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Testing

- 24 hour urine
- Blood
- Dried urine
- Saliva

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Symptoms of Hormone Deficiencies Women

Women: Common Symptoms	Estrogen	Progesterone	Thyroid	Glucocorticoids	DHEA	Testosterone	GrowthHormone	Melatonin	Oxytocin
Hot flashes	✓	✓							
Night sweats	✓	✓		✓					
Headaches	✓	✓					✓	✓	✓
Hair loss	✓		✓		✓	✓			
Poor sleep	✓	✓		✓			✓	✓	
Anxiety	✓	✓	✓	✓	✓	✓			✓
Depression	✓	✓	✓	✓	✓	✓	✓	✓	✓
Stress	✓	✓	✓	✓	✓	✓	✓	✓	✓
Low libido	✓	✓	✓	✓	✓	✓			✓
Memory lapse	✓		✓	✓		✓			
Sugar cravings		✓		✓	✓	✓			
Weight gain	✓	✓	✓	✓	✓	✓	✓	✓	✓
Increased facial hair/acne	✓				✓	✓			

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Symptoms of Hormone Deficiency Males

Men: Common Symptoms	Estrogen	Progesterone	Thyroid	Glucocorticoids	DHEA	Testosterone	GrowthHormone	Melatonin	Oxytocin
Poor stamina			✓	✓	✓	✓	✓		
Decreased muscle mass/strength					✓	✓	✓		
Neck/back pain						✓			
Low libido									
Decreased erections		✓		✓	✓	✓			✓
Sugar cravings			✓				✓		
Weight gain	✓		✓	✓	✓	✓	✓	✓	✓
Stress			✓	✓	✓	✓	✓	✓	✓
Apathy/burned out feeling			✓	✓	✓	✓	✓		✓
Anxiety		✓	✓	✓	✓	✓			✓
Depression		✓	✓	✓	✓	✓	✓		✓
Poor Cognition	✓		✓	✓	✓	✓	✓		
Memory lapse	✓		✓	✓	✓	✓	✓		

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Urine Hormone Testing

- The beauty of the hormone test through urine is that we get the metabolites.
- Measuring urine hormone metabolites reveals how the patient is breaking down their hormones. The breakdown metabolites of estrogen for example can give us insight into the patient's ability to detoxify her/his estrogens to decrease risk of estrogen-dependent cancers.
- Some estrogen metabolites have been shown to increase the risk for breast and prostate cancer in women and men, respectively.
- **Urine biomarkers of risk in the molecular etiology of breast cancer.** *Breast Cancer; Basic & Clinical Research* 3, 1-8 (2009).
- This study validates the finding that women with breast cancer or at high risk for the disease have significantly higher levels of **depurinating estrogen-DNA adducts in their urine than healthy, normal-risk women.** These data predict that depurinating estrogen-DNA adducts could become biomarkers for early detection of breast cancer risk and be used in prevention strategies.
- Estrogens can initiate cancer by reacting with DNA. Specific metabolites of endogenous estrogens, the catechol estrogen-3,4-quinones, react with DNA to form depurinating estrogen-DNA adducts. Loss of these adducts leaves apurinic sites in the DNA, generating mutations that can lead to the initiation of cancer.
- Novel biomarkers for risk of prostate cancer. Results from a case-control study. *Prostate* 69,41-48 (2009).
- This study showed that men with prostate cancer have significantly higher levels of depurinating estrogen-DNA adducts in their urine compared with healthy men. These data suggest that depurinating estrogen-DNA adducts could serve as potential biomarkers to predict risk for prostate cancer.
- [Clin Transl Med. 2016; 5: 12. Depurinating estrogen-DNA adducts, generators of cancer initiation: their minimization leads to cancer prevention](#)

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Urine Reflects Tissue Levels

- An important aspect of the link between estrogen and breast cancer is whether urinary estrogen levels are representative of the intra-tissue levels of bioavailable estrogens.
- (2010) in "Comparison of estrogens and estrogen metabolites in human breast tissue and urine" PMID: 20678202 have shown in particular that urinary 2/16 ratio is a good approximation of the ratio observed in breast tissue.

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FDA: 24-hr urine reflects blood

- We made repeated measurements of serum concentrations of estrone (E1), estradiol (E2), estriol (E3), estetrol (E4), daidzein (DDZ), genistein (GEN) and bisphenol A (BPA) in 30 pregnant women using ultra-performance liquid chromatography coupled with tandem mass spectrometry detection (UPLC-MS/MS) and electrospray ionization (ESI).
- Serum E1, E2, and E3 concentrations varied significantly (coefficients of variation 9-10%) with broad ranges across the cohort: 1.61-85.1 nM, 9.09-69.7 nM, and 1.5-36.3 nM respectively.
- **The 24-h urinary elimination profiles of endogenous estrogens were each strongly correlated with their corresponding serum concentrations (Pearson's Correlation Coefficients of 0.83 (E1), 0.84 (E2) and 0.94 (E3)).**
- Food Chem Toxicol. 2018 Mar 13. pii: S0278-6915(18)30166-2. doi: 10.1016/j.fct.2018.03.017. **Comparative estrogenicity of endogenous, environmental and dietary estrogens in pregnant women I: Serum levels, variability and the basis for urinary biomonitoring of serum estrogenicity.**

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If on BHRT or HRT

- Must only test blood 4 hours later
- Do not take thyroid that morning

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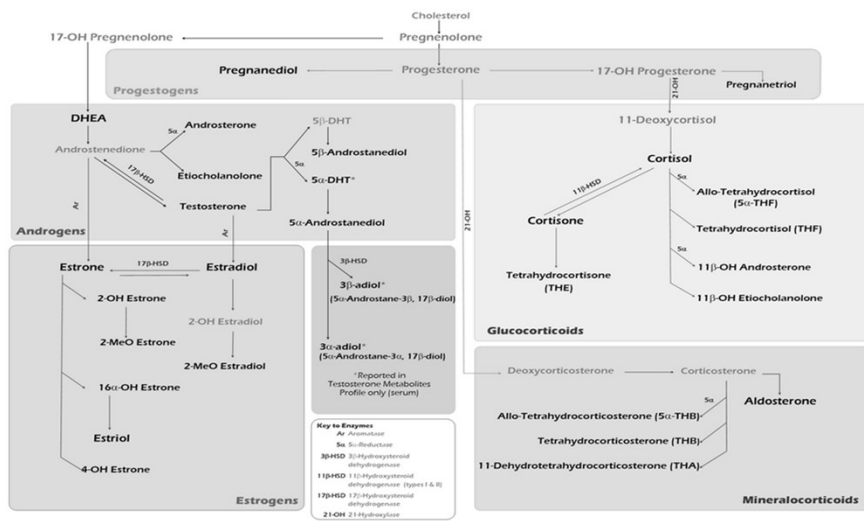
2 MEO

- 2-methoxyestradiol: considered as potential therapeutic agents due to their antitumor activity via induction of apoptosis and inhibition of angiogenesis.
- It also shows methylation capabilities as the catechol estrogens have to be methylated to make 2 MEO.
- 2-Methoxyestradiol: an endogenous antiangiogenic and antiproliferative drug candidate. *Cancer Metastasis Rev.* 19:173–179. [PMID: 11191057]
- The physiological estrogen metabolite 2-methoxyestradiol reduces tumor growth and induces apoptosis in human solid tumors. *J Cancer Res Clin Oncol.* 127:405–410. [PMID: 11469676]
- 2-Methoxyestradiol inhibits proliferation and induces apoptosis independently of estrogen receptors alpha and beta. *Cancer Res.* 62:3691–3697. [PMID: 12097276]
- . (1999). Potent antitumor activity of 2- methoxyestradiol in human pancreatic cancer cell lines. *Clin Cancer Res.* 5:493–499. [PMID: 10100698]

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Hormone Pathways



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Urine Testing

- Urine hormone testing uses advanced LC-MS/MS and GC-MS/MS technology, the most sensitive and advanced hormone testing available today.
- It measures important metabolites not available in serum or saliva testing, providing a clearer picture of hormone balance and function.
- Metabolites that increase risk for cancers, osteoporosis, and other serious conditions, as well as protective metabolites, are measured. This allows greater safety in prescribing hormone therapy or herbal therapy.

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- Urine hormone testing also allows for a full-day perspective on hormone production – important because some hormones are produced primarily at late at night, early in the morning, or in pulses throughout the day.
- A single blood draw or saliva sample cannot account for this variability.
- Though many top hormone doctors do only use serum, so you have to know there are many ways to test and treat and none of them deal with hormones locally produced (intracrinology).
- Urine testing measures free and conjugated hormones, providing a true measure of bioavailable hormones.
- Serum testing is excellent for peptide hormones such as Luteinizing Hormone (LH), Follicle Stimulating Hormone (FSH), Insulin-like Growth Factor-1 (IGF-1, and some thyroid hormones. Serum testing is used for Testosterone Metabolites profile.

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Most complete

- **Comprehensive ULTIMATE**
- **24-Hour Urine Hormone Testing**
- **Code: 4100**
- The Comprehensive ULTIMATE is the most complete urine hormone panel.
- This panel measures estrogens and clinically relevant estrogen metabolites, which allow for assessment of cancer risk factors and detoxification pathways. Pregnanediol assays progesterone activity in the body. DHEA, testosterone and their metabolites provide a detailed assessment of androgen function. Cortisol, cortisone, aldosterone and their metabolites provide an industry-leading evaluation of adrenal health. Urinary free T3 and free T4 provide a sensitive gauge of thyroid hormone status. The ComprehensivePlus panel also calculates 5 α – Reductase and 11 β -Hydroxysteroid Dehydrogenase II enzyme activity. 5 α – Reductase is an important enzyme that governs androgen metabolism and is associated with insulin resistance and other conditions. 11 β -HSD determines the balance between cortisol and cortisone. hGH, Oxytocin, and Melatonin are also measured.

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Follow up Dried Urine Hormone

- **CompletePLUS**
- **Dried Urine Hormone Testing**
- **Code: 4990**
- The CompletePLUS provides a broad and in-depth evaluation of hormone balance, function and circadian cortisol pattern.
- This panel measures estrogens and clinically relevant estrogen metabolites, which allow for assessment of cancer risk factors and detoxification pathways. Pregnanediol assays progesterone activity in the body. DHEA, testosterone and their metabolites provide a detailed assessment of androgen function. Cortisol, cortisone, and their metabolites, combined with 4-point cortisol and cortisone curves, provide an industry-leading evaluation of adrenal health.
- I use this as a follow-up of the ultimate 24-hour urine collection test.

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Progesterone Metabolites

- **Progesterone Metabolites Profile**
- **Serum / Bloodspot**
- **Code: 4988 / 4989**
- The role of progesterone in protecting vs. increasing breast cancer risk is not clear cut but has largely been attributed to the use of synthetic progestins.
- Recent in vitro research using normal and breast cancer cell lines suggest that there is a definable difference in progesterone metabolism in situ between these cell lines.
- This difference may be an important risk factor for the development and progression of breast cancer.

- Progesterone metabolites in breast cancer. *Endocrine-Related Cancer* (2006) 13 717–738.
John P Wiebe Department of Biology, Hormonal Regulatory Mechanisms Laboratory,
University of Western Ontario, London, Ontario, Canada N6A 5B7

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Goldilocks Principle Rules

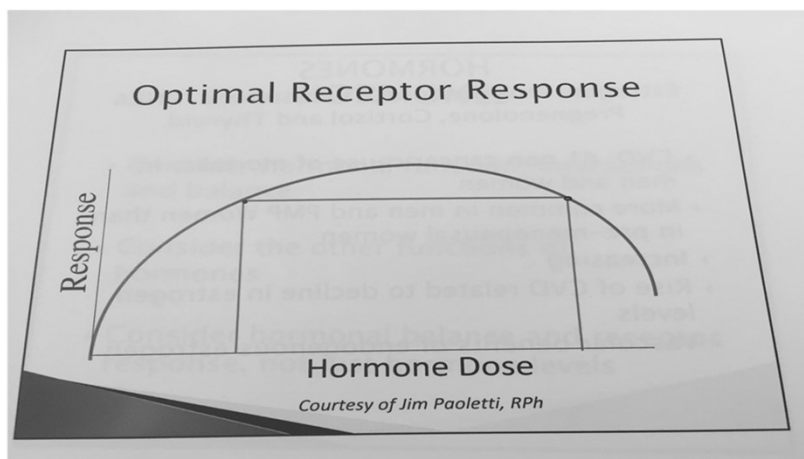
Hormones Are More About Balance Between Each Other & Between Receptors
Than Blood, Urine or Saliva Levels



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Too much not good, too little not good



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Bioidentical Versus Synthetic

Bioidentical

- Progesterone
- Estradiol
- Estriol
- Testosterone
- Pregnenolone
- DHEA
- **Not FDA approved**

- **Progesterone Substitutes:** Progestins (tamp down ER beta) MPA medroxy progesterone acetate, norethindrone Acetate (OC'Ps) Norgestryl (OCP's)
- **Estrogen Substitutes:**
 - (Conjugated Equine Estrogens CEE/Premarin)
 - Ethinyl Estradiol (OCP's)
 - Not metabolized as bioidentical hormones
 - Different end actions in different women
 - **FDA approved**
 - Replenish

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Organic Acids

- Xanthurenic (XANA) and Kynurenic Acid (KYNA) are metabolites on the Kynurenine Pathway of tryptophan metabolism.
- These are part of the 24-hr urine test to help with the clinical management of estrogen detoxification.
- Studies indicate that individuals with low-activity catechol-O-methyltransferase (COMT) may require additional B6, B12 and folate to detoxify pro-carcinogenic estrogen metabolites.
- While high levels of Xanthurenic and Kynurenic Acid are commonly associated with mild or subclinical B6 deficiency and/or inflammation, the vitamin B2 requirement for XANA synthesis is seldom discussed or acknowledged in other laboratory reports.

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High levels

- **Insulin resistance and diabetes**
 - High levels of XANA may form complexes that block insulin receptors and, over time, destroy pancreatic cells.
- **Cancer risk**
- KYNA, and to a lesser extent, XANA both bind to and activate the aryl hydrocarbon receptor (AhR). Activation of the AhR either by environmental toxins (dioxin, etc.) or XANA and KYNA can induce cell damage and carcinogenesis.

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Cardiovascular function

- Higher XANA levels are associated with cardiovascular disease.
- Chronic inflammation may increase the amount of circulating tryptophan metabolized outside of the liver.
- Peripheral metabolism of tryptophan in leucocytes, endothelial cells, macrophages and vascular smooth muscle cells increase risk factors for atherosclerosis in those with elevated LDL-cholesterol, BMI, or triglycerides, particularly in younger women

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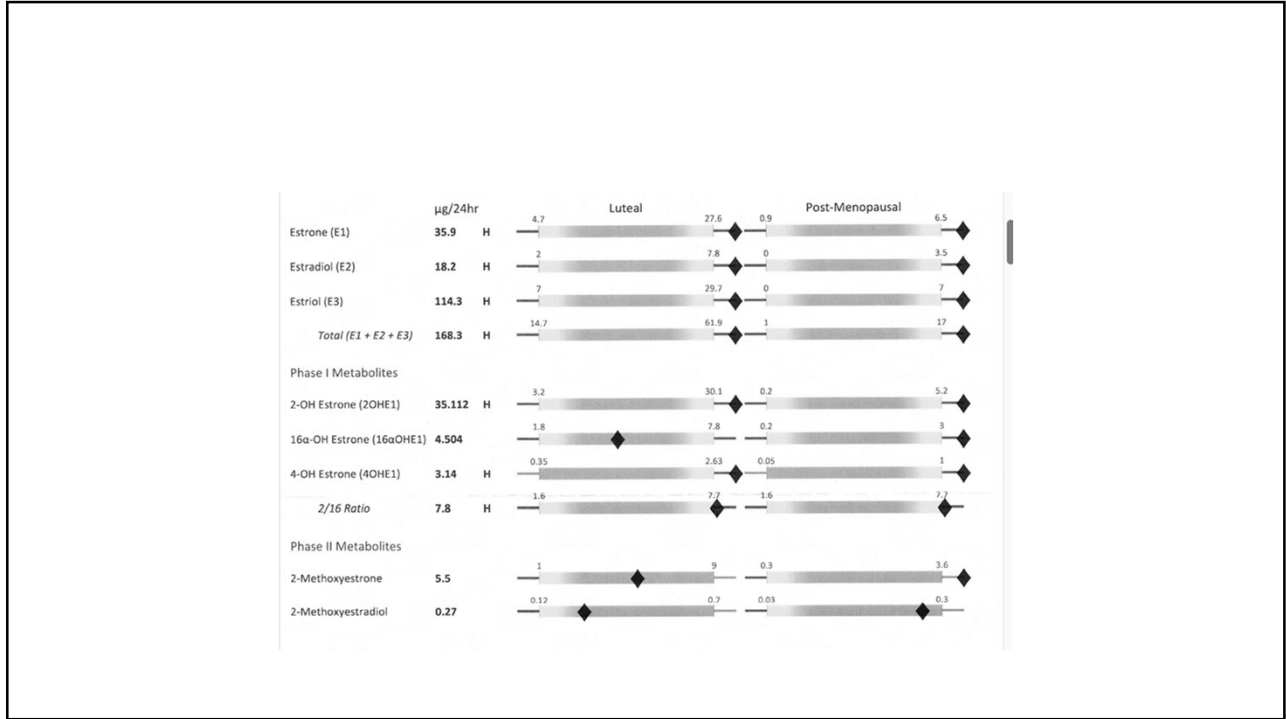
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Autoimmunity + Inflammation

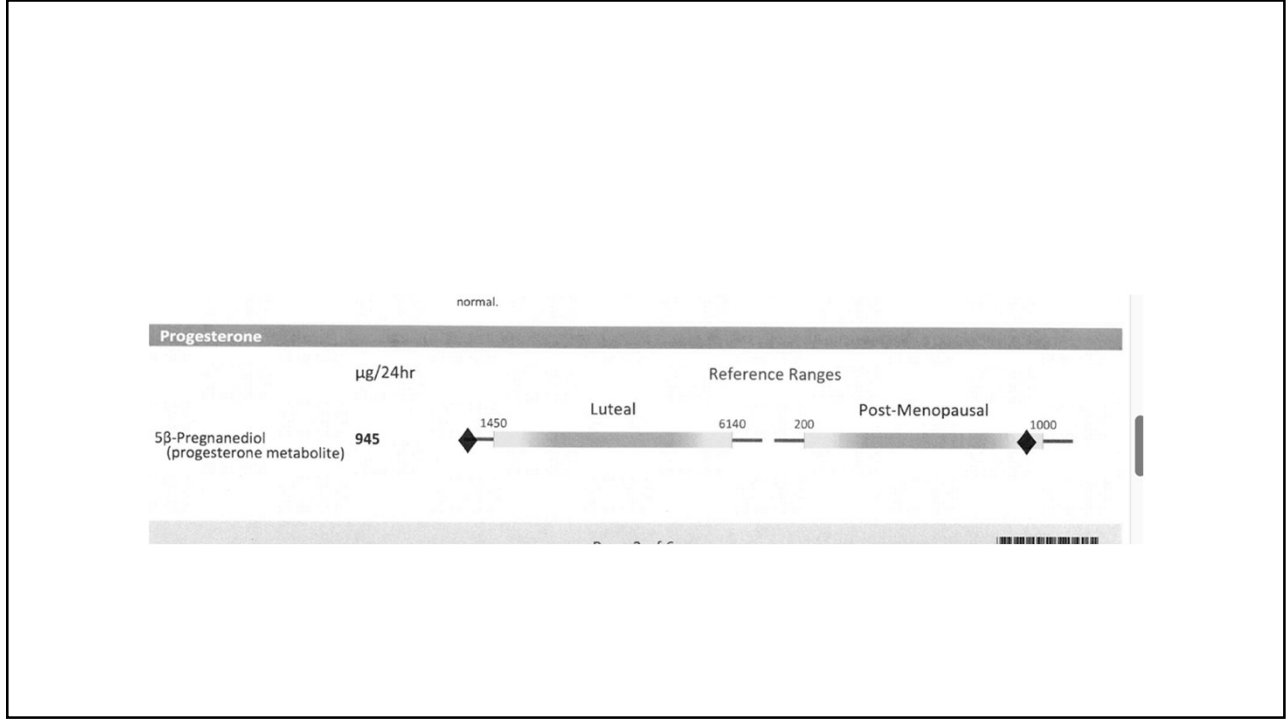
- KYNA levels modulate the production of IL-6 and increased levels of IL-6 are associated with rheumatoid arthritis (RA), systemic-onset juvenile chronic arthritis (JCA), osteoporosis, and psoriasis.
- IL-10 lowers IL-6. Estrogen lowers IL-6. Oxytocin lowers IL-6. Specific *L. reuterii* (BioGaia) ups IL-10 and lowers IL-6.
- The Kynurenine Pathway metabolizes excess tryptophan and controls hepatic heme synthesis and tryptophan availability for serotonin synthesis. The Kynurenic Pathway also produces immune-regulatory and neuroactive metabolites, nicotinic acid (vitamin B3), and oxidized nicotinamide adenine dinucleotide (NAD+).
- During homeostasis, the primary site of Kynurenic Pathway activity is the liver, where all of the enzymes to metabolize tryptophan into NAD+ are found, and account for 90% of tryptophan metabolism.
- During chronic inflammation, the extra-hepatic metabolism of tryptophan increases, and B6 levels decrease. **Pro-inflammatory cytokines, combined with lower B6 levels**, shift the Kynurenic pathway to produce more Xanthurenic and Kynurenic Acid (see diagram).
- **Conversely, low levels of both Xanthurenic and Kynurenic Acid may indicate a tryptophan deficiency**, a liver disorder, or a very rarely, severe B6 deficiency.

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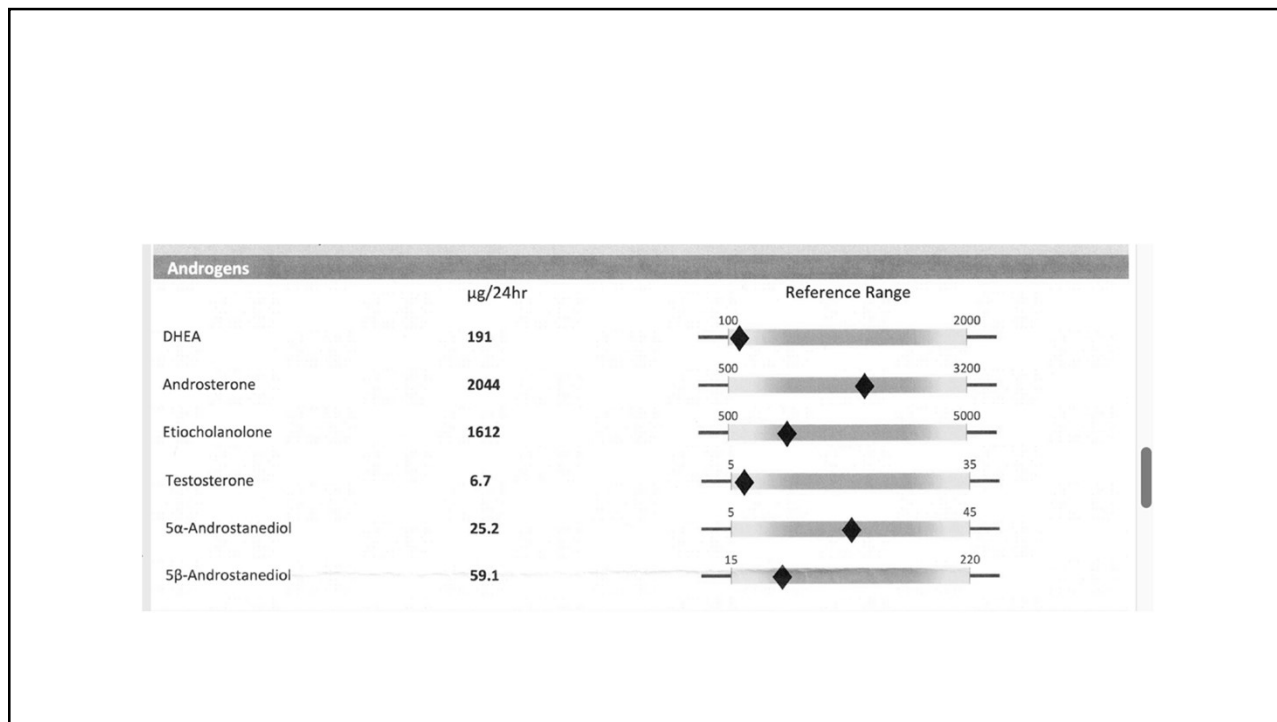
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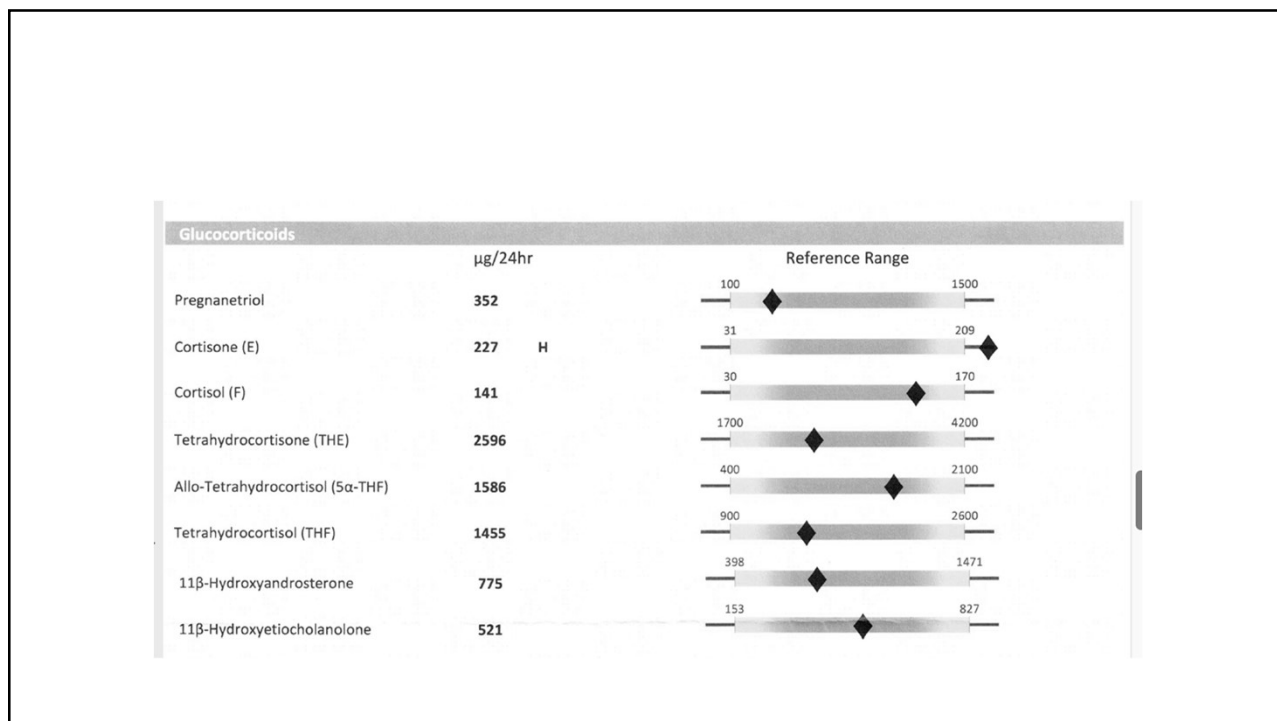
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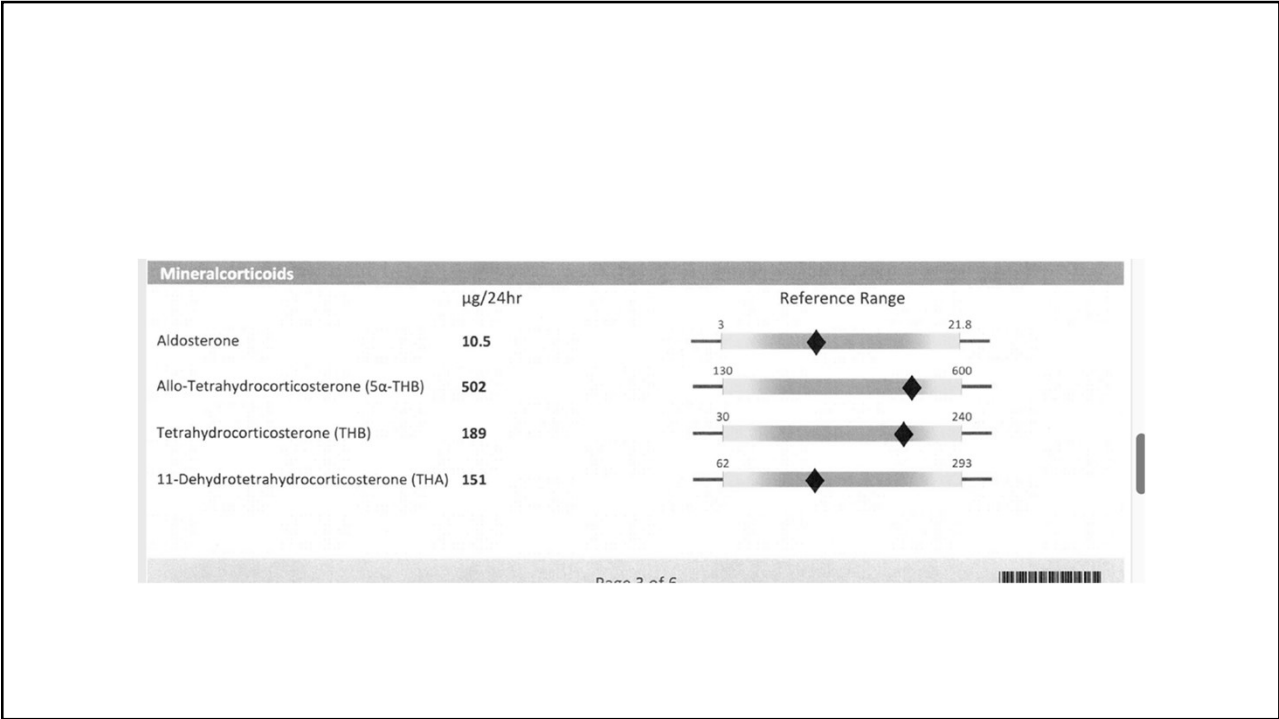
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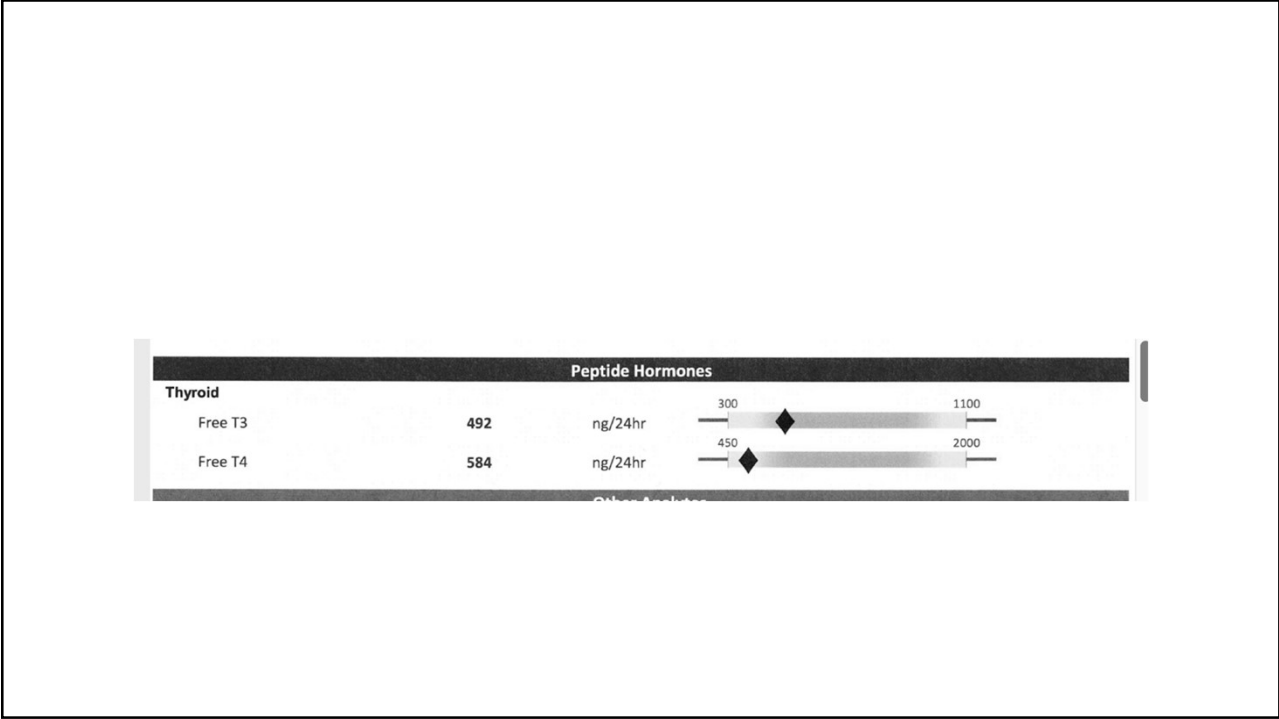
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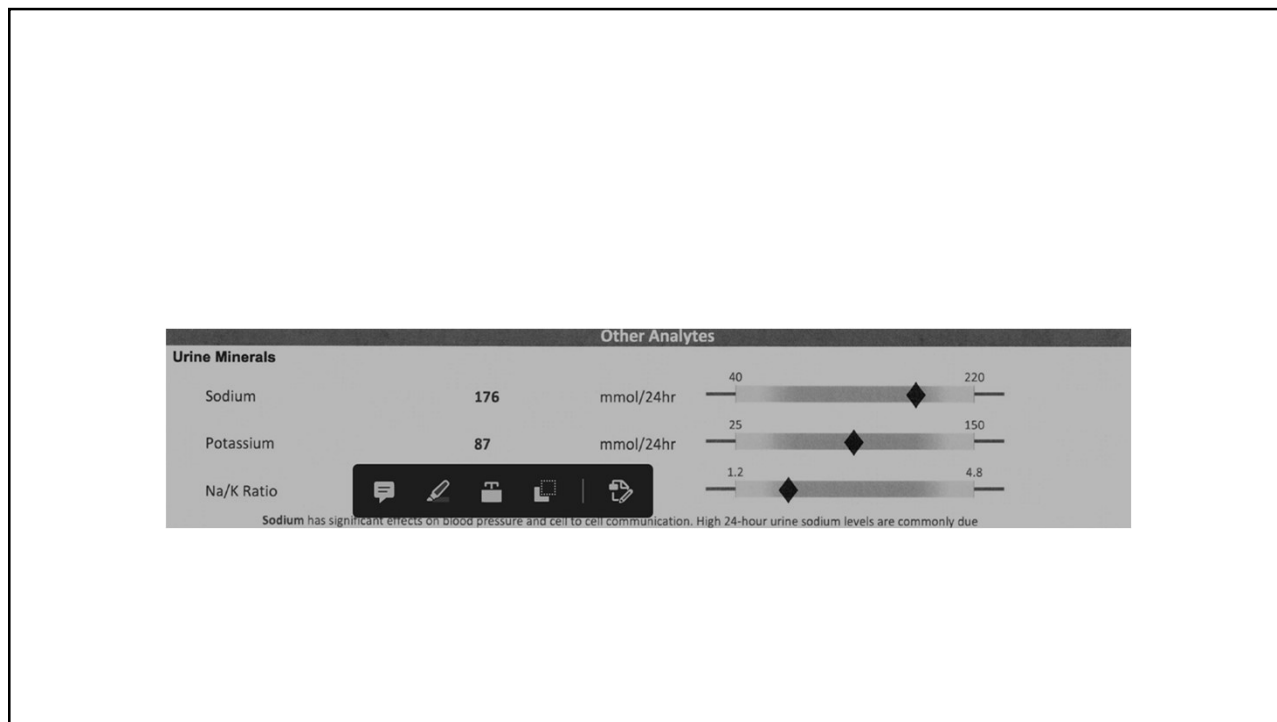
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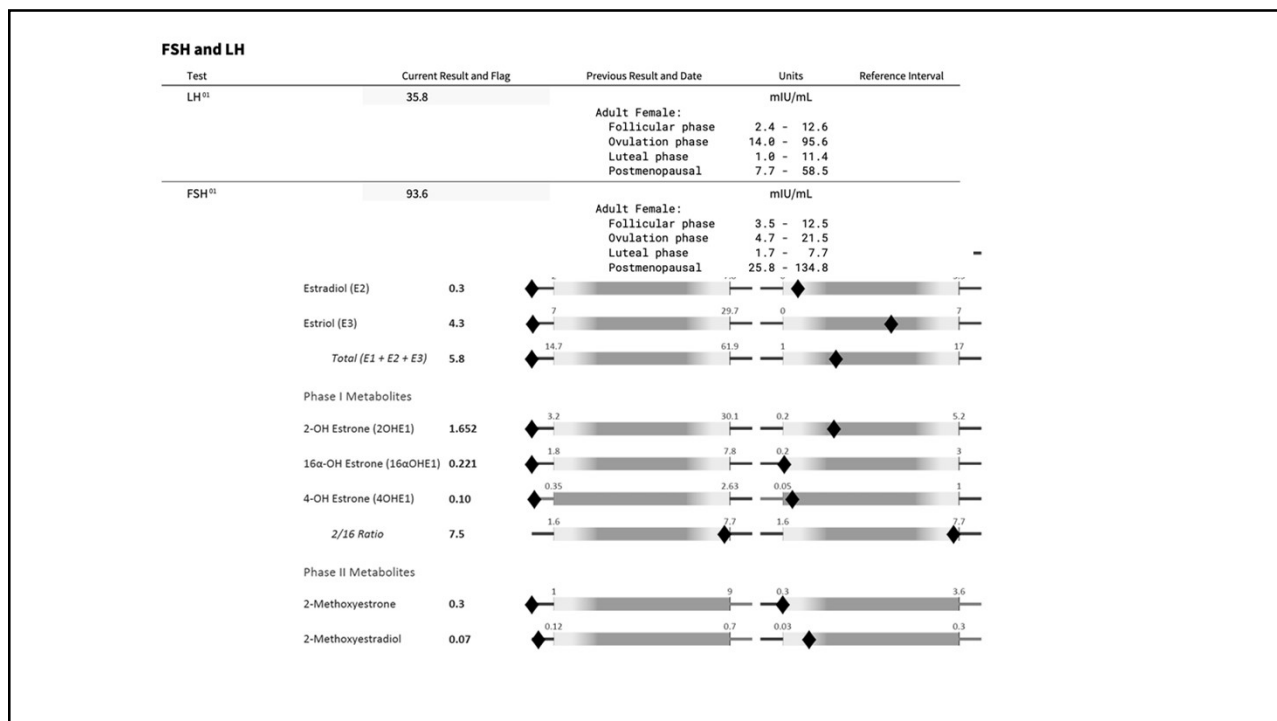
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Estradiol				
Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Estradiol ⁰¹	<5.0		pg/mL	
		Adult Female:		
		Follicular phase	12.5 - 166.0	
		Ovulation phase	85.8 - 498.0	
		Luteal phase	43.8 - 211.0	
		Postmenopausal	<6.0 - 54.7	
		Pregnancy		
		1st trimester	215.0 - >4300.0	
Roche ECLIA methodology				

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Progesterone

µg/24hr

Reference Ranges

5β-Pregnanediol (progesterone metabolite) 435

Luteal Post-Menopausal

1450 6140 200 1000

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Progesterone

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Progesterone ⁰¹	0.4		ng/mL	
		Follicular phase	0.1 - 0.9	
		Luteal phase	1.8 - 23.9	
		Ovulation phase	0.1 - 12.0	
		Pregnant		
		First trimester	11.0 - 44.3	
		Second trimester	25.4 - 83.3	
		Third trimester	58.7 - 214.0	
		Postmenopausal	0.0 - 0.1	

Estrogens, Total

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Estrogens, Total ⁰¹	50		pg/mL	40-244
		Prepubertal	< 40	
		Female Cycle:		

labcorp

Date Created and Stored 03/23/23 1907 ET **Preliminary Report** Page 2 of 4

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Sex Horm Binding Glob, Serum					
Test	Current Result and Flag		Previous Result and Date	Units	Reference Interval
▲ Sex Horm Binding Glob, Serum ⁰¹	127.0	High		nmol/L	17.3-125.0

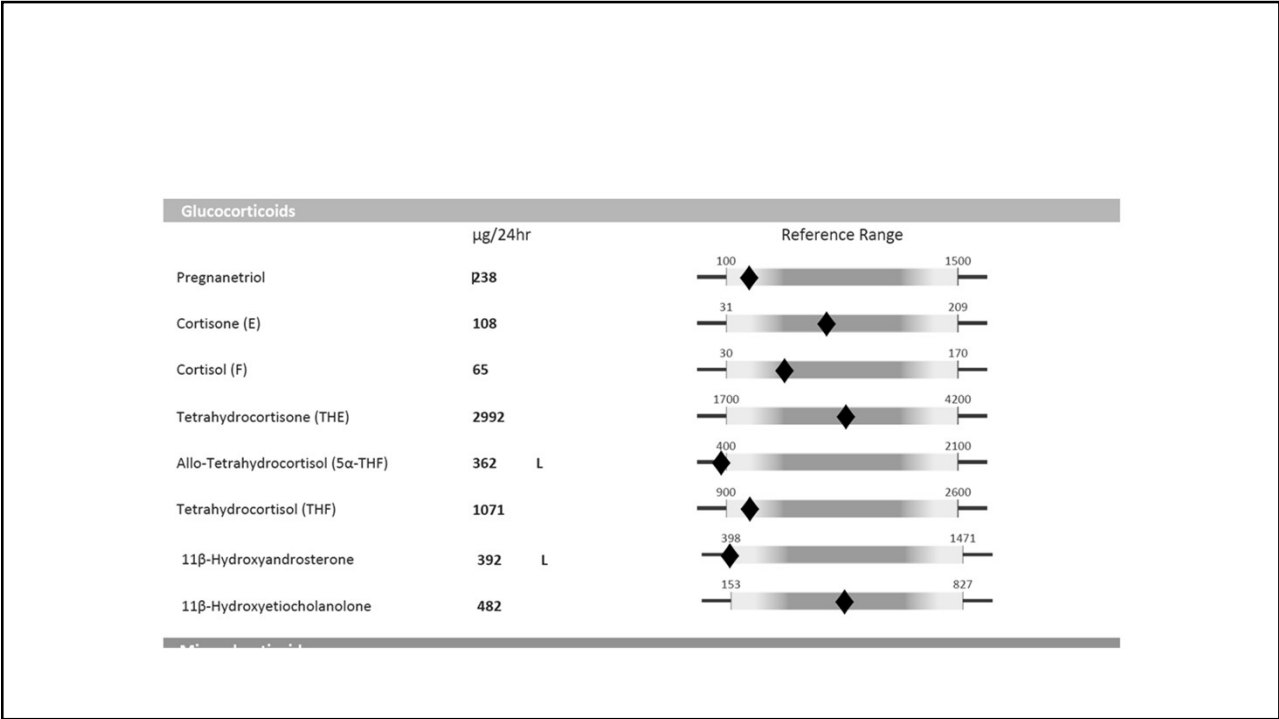
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Androgens					Reference Range	
	µg/24hr					
DHEA	19	L	◆	100	2000	
Androsterone	221	L	◆	500	3200	
Etiocholanolone	365	L	◆	500	5000	
Testosterone	11.5		◆	5	35	
5α-Androstane-diol	2.9	L	◆	5	45	
5β-Androstane-diol	16.8		◆	15	220	

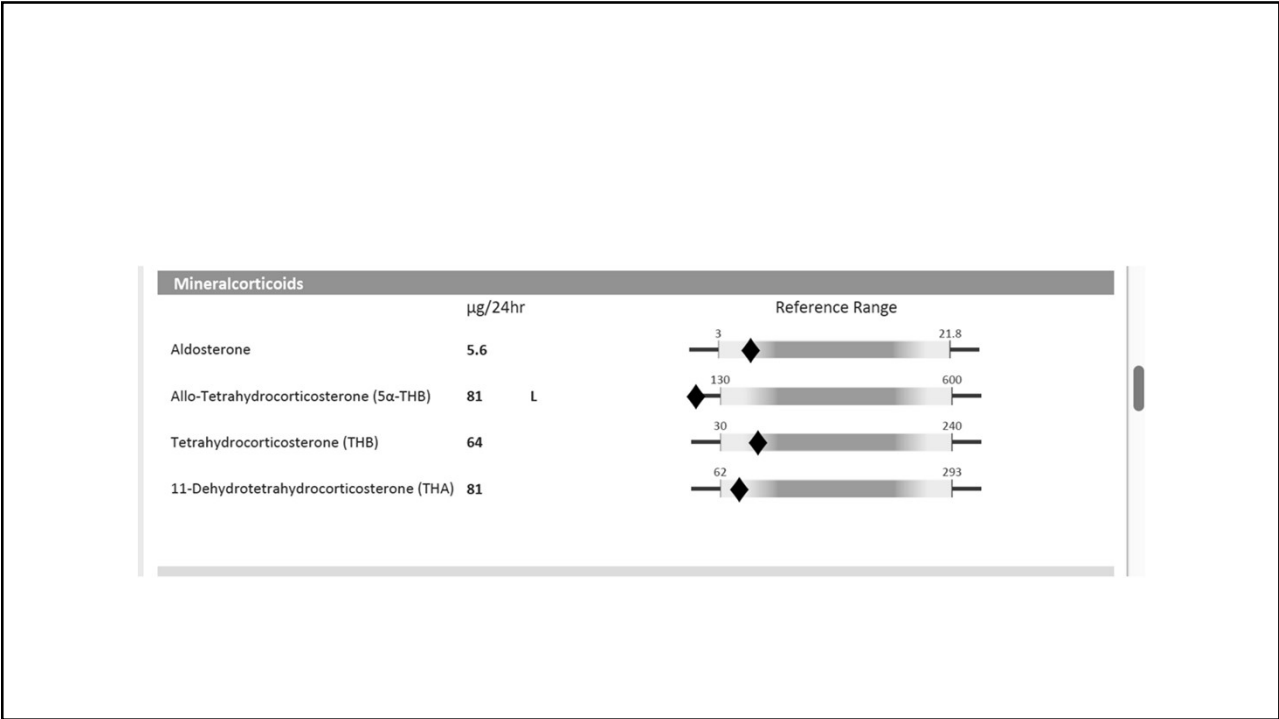
Date Collected: 03/16/2023

Testosterone, F/WklyBd+T LC/MS					
Test	Current Result and Flag		Previous Result and Date	Units	Reference Interval
Testosterone, Total, LC/MS ^{A, 01}	20.2			ng/dL	7.0-40.0
Testost., % Free+Weakly Bound ^{B, 01}	5.0			%	3.0-18.0
Testost., F+W Bound	1.0			ng/dL	0.0-9.5

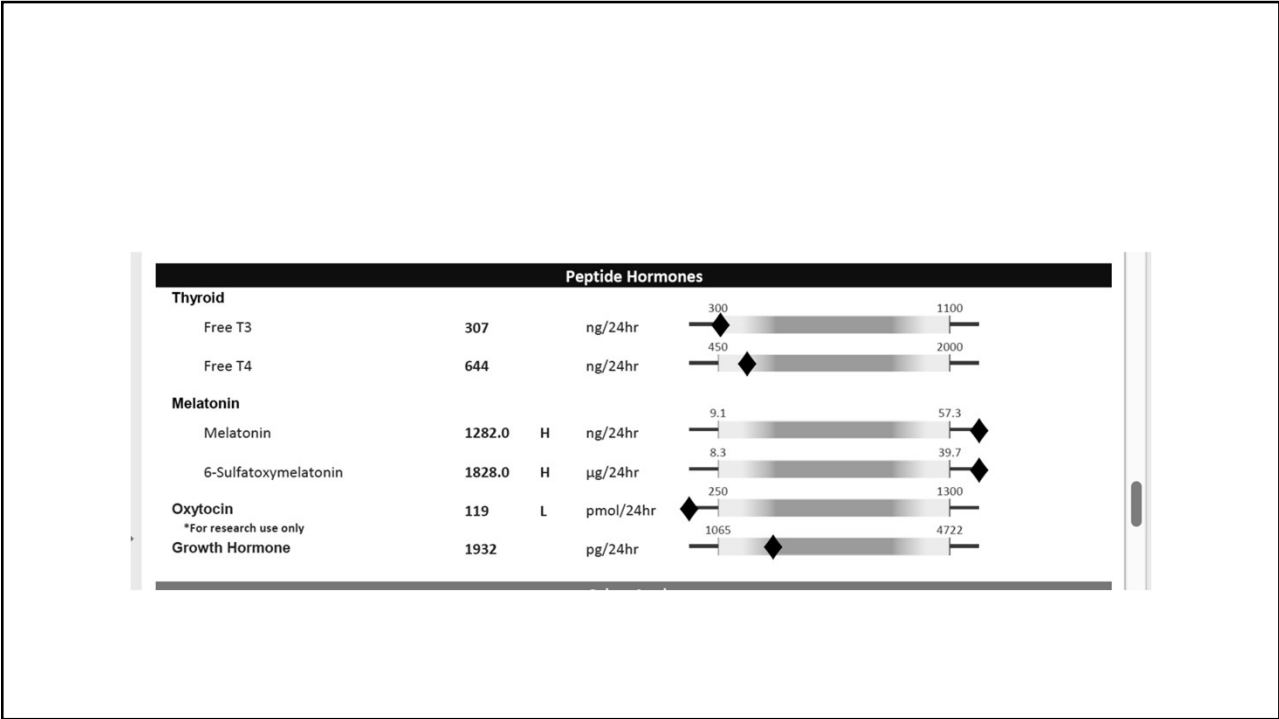
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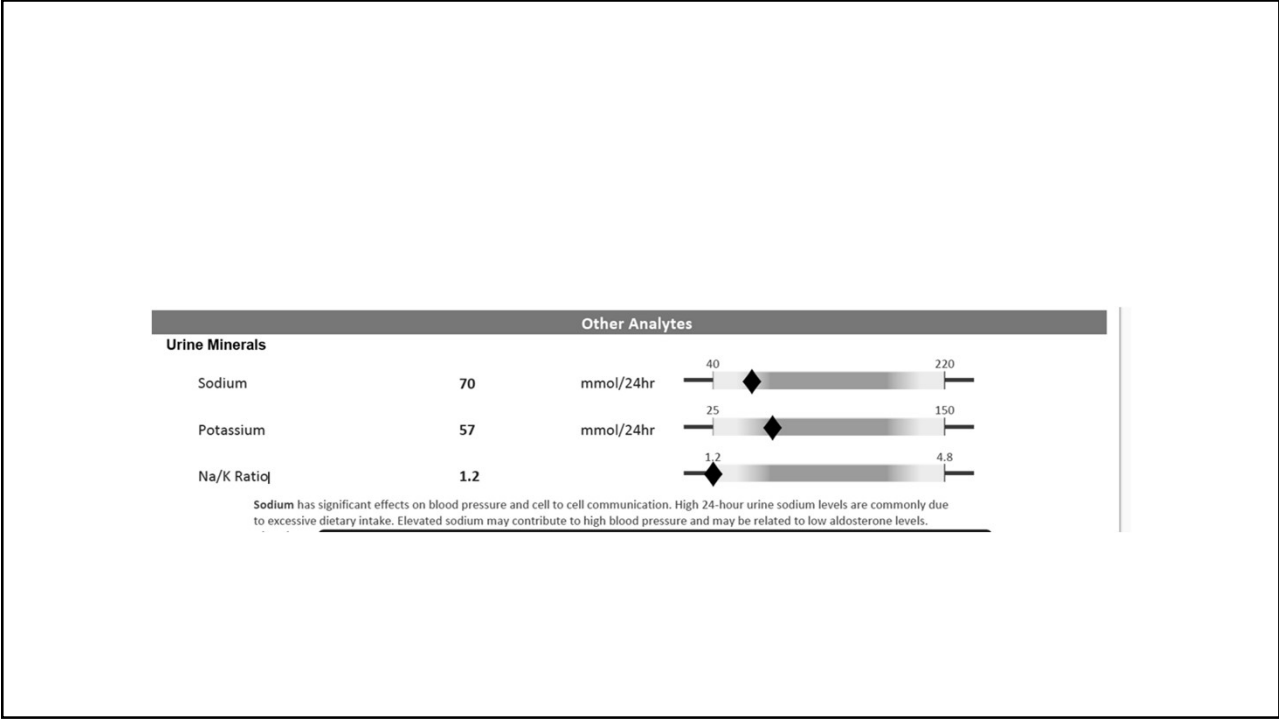
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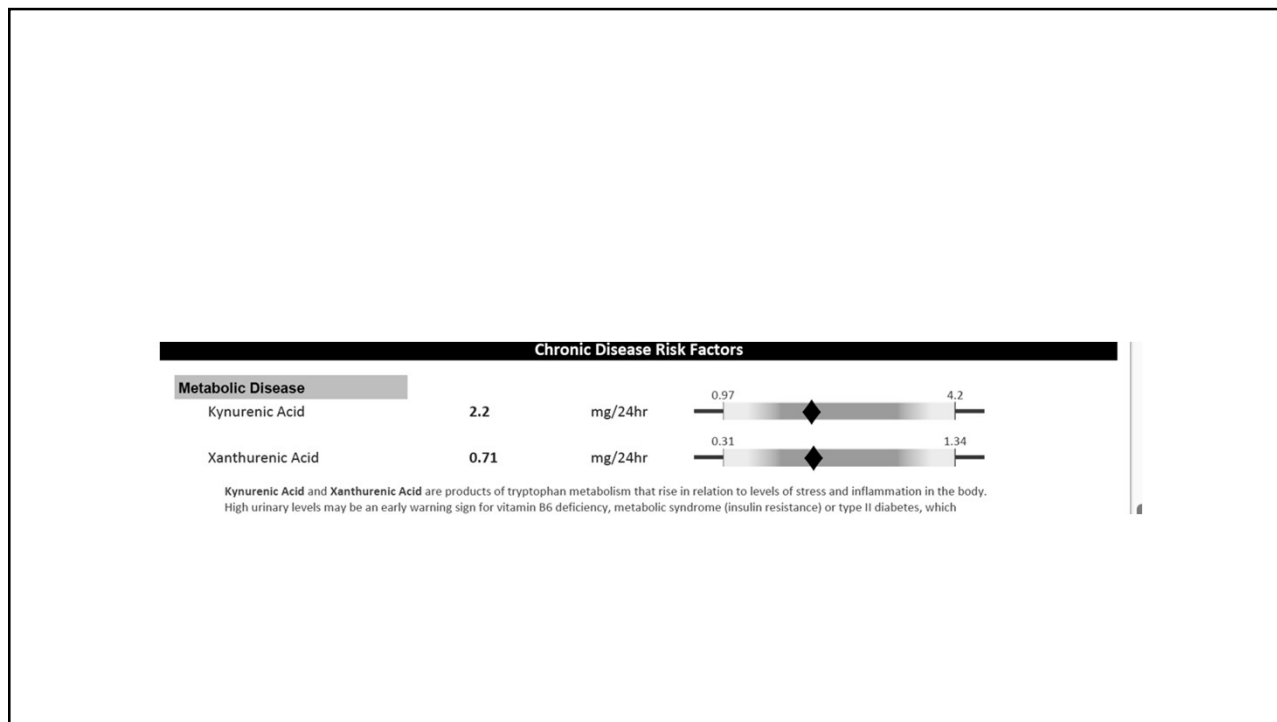
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None or Never	Mild or Infrequent	Moderate or Frequent	Severe or Daily
Please fill in the circle of the number that most closely corresponds to what you are experiencing.			
<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Joint or Muscle Pain <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Fibromyalgia <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Headaches <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Neck or back pain <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Decreased strength <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Numbness in hands or feet <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Decreased flexibility <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Decreased muscle size <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Decreased stamina <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Insomnia/disturbed sleep <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Morning fatigue <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Evening fatigue <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Burned out feeling <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Apathy/Mental Fatigue <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Depression <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Mood swings/tearfulness <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Irritability/Anger <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Nervousness/anxiety <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Foggy thinking/ Loss of Concentration <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Forgetfulness/ Memory lapse ...	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Stress <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> PTSD <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Heart palpitations <input type="radio"/> 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type="radio"/> Excessive sweating/ Night sweats <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Insulin resistance or type II diabetes	<input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Sugar cravings <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Low blood sugar <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> High cholesterol <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Elevated triglycerides <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Abdominal weight gain <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Bone loss <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Allergies <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Sensitivity to chemicals <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Decreased libido <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Fertility problems <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Loss of eyebrows <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Loss of scalp hair <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Puffy eyes/face <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Hair dry or brittle <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Nails breaking or brittle <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Thinning skin <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Acne <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Rapid aging <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> Increased (facial) and/or body hair Other: <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/> <input type="radio"/>	

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Hormone or Medication	Brand Name	Delivery Form	Dosage (in mg)	Times per day	Days per month	How long used?	Last date/ time used
Estrogens	Bioest Compound	Cream/foam	0.5	1	30	4 yrs	Jun 5 th ~ 10:30
Progesterone	Progesterone Compound	Cream/foam	7.5 (15 in 2 capsules)	1	30	4 yrs	Jun 5 th ~ 10:30
Testosterone	Testosterone Compound	Cream/foam	0.75	1	30	4 yrs	Jun 5 th ~ 10:30
DHEA							

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Hyperexcreters

Collected: 06/01/2017 / 09:13 CDT
 Received: 06/03/2017 / 11:20 CDT
 Reported: 06/07/2017 / 19:30 CDT

Insufficiency. Optimal levels are > or = 30 ng/mL.

VITAMIN D, 25-OH, D3	47	See Below ng/mL
Reference Range: Not established		
VITAMIN D, 25-OH, D2	<4	See Below ng/mL
Reference Range: Not established		
ESTRADIOL, FREE, LC/MS/MS		E2
ESTRADIOL, FREE	<0.03	pg/mL

FEMALE REFERENCE RANGES FOR ESTRADIOL, FREE:

Follicular Stage: 0.43-5.03 pg/mL
 Mid-cycle Stage: 0.72-5.89 pg/mL
 Luteal Stage: 0.40-5.59 pg/mL
 Postmenopausal: < or = 0.28 pg/mL

ESTRADIOL	<2	pg/mL
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FEMALE REFERENCE RANGES FOR ESTRADIOL:

Follicular Stage: 39-378 pg/mL
 Mid-cycle Stage: 84-762 pg/mL
 Luteal Stage: 48-440 pg/mL
 Postmenopausal: < or = 10 pg/mL

This test was developed and its analytical performance characteristics have been determined by Quest Diagnostics Nichols Institute San Juan Capistrano. It has not been cleared or approved by FDA. This assay has been validated pursuant to the CLIA regulations and is used for clinical purposes.

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Growth Hormone, Serum TM	0.1		ng/mL	0.0-10.0

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Progesterone TM	0.4		ng/mL	
		Follicular phase	0.1 - 0.9	
		Luteal phase	1.8 - 23.9	
		Ovulation phase	0.1 - 12.0	
		Pregnant		
		First trimester	11.0 - 44.3	
		Second trimester	25.4 - 83.3	
		Third trimester	58.7 - 214.0	
		Postmenopausal	0.0 - 0.1	

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Estrogens, Total				

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<i>Date Collected</i> 7/25/2017	<i>Date Received</i> 7/27/2017	<i>Date Reported</i> 8/4/2017	<i>Tech</i> DH
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Analyte	µg/24hr		Luteal Phase	Post Menopausal
CREATININE	1.2 gm			0.5 - 2
TOTAL VOLUME	2000 mL			
Estrone (E1)	21.0		4.7 - 27.6	0.9 - 6.5
Estradiol (E2)	9.6	HIGH	2 - 7.8	0 - 3.5
Estriol (E3)	100.2	HIGH	7 - 29.7	0 - 7
Total Estrogens (E1+E2+E3)	130.8	HIGH	14.7 - 61.9	1 - 17
Estrogen Quotient (E3/(E1+E2))	3.3		> 1	> 1
2-Hydroxyestrone (2OHE1)	27.4		3.2 - 30.1	0.2 - 5.2
16α-Hydroxyestrone (16αOHE1)	1.8		1.8 - 7.8	0.2 - 3
2 / 16α Ratio	14.9	HIGH	1.6 - 7.7	1.6 - 7.7
4-Hydroxyestrone	2.42		0.35 - 2.63	0.05 - 1
2-Methoxyestrone	5.1		1 - 9	0.3 - 3.6
2-Methoxyestradiol	0.33		0.12 - 0.7	0.03 - 0.3
Pregnanediol (progesterone metabolite)	7308	HIGH	1450 - 6140	200 - 1000

Reference Range in Follicular Phase and Mid-Cycle					
	Estrone	Estradiol	Estriol	Total Estrogens	Pregnanediol
Follicular Phase (µg/24hr)	2.0 - 39	1.0 - 23	3.0 - 48	7.0 - 110	0 - 2500
Mid-Cycle (µg/24hr)	11.0 - 46	4.0 - 45	20 - 130	36 - 221	N/A