

24-Hour PLUS Profile

Comments:

Creatinine: 1.0 gm/24hr 

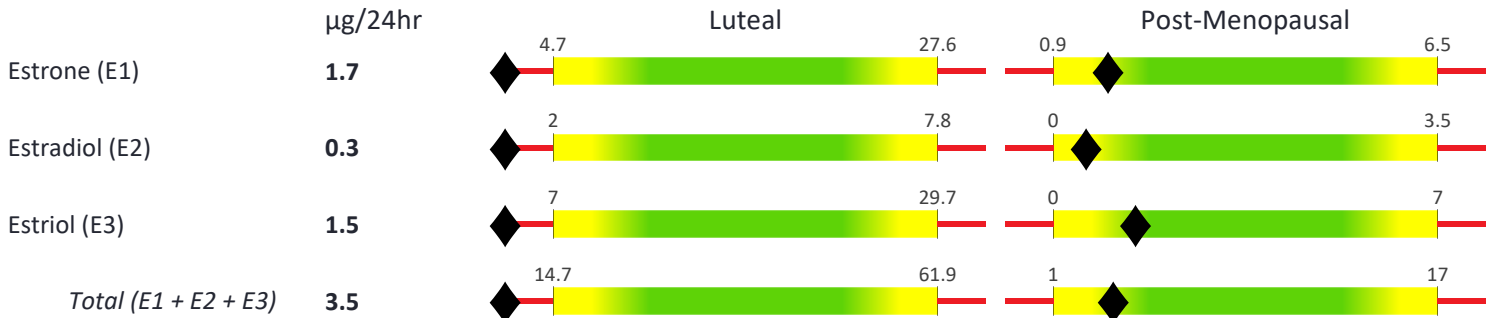
Total Urine Volume: 1300 ml

Estrogens

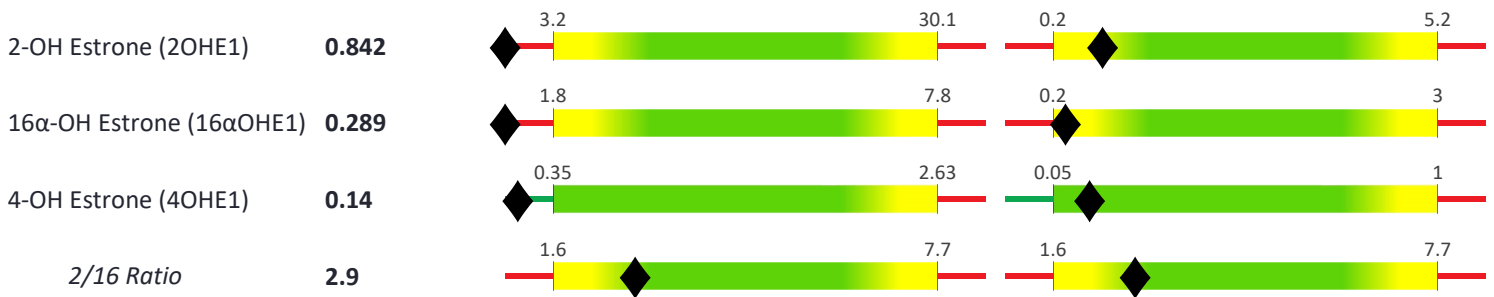
Reference Ranges

Refer to the luteal reference range for cycling women collecting during the luteal phase and for postmenopausal women currently using estrogen and/or progesterone.

Refer to the post-menopausal reference range for post-menopausal women not currently using hormones.



Phase I Metabolites



Phase II Metabolites



Other Reference Ranges

	Estrone	Estradiol	Estriol	Estrogen Total	Pregnanediol
Follicular	2.0-39	1.0-23	3.0-48	7.0-110	0-2500
Mid-Cycle	11.0-46	4.0-45	20-130	38-221	N/A

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Accession #:

Test Code: **4080**

Sex: **F**

Patient Name:

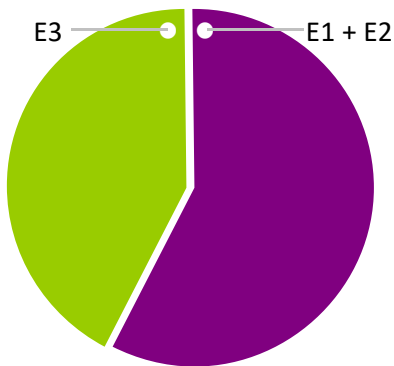
Estrogen Ratios

Estrogen Ratios

Estrogen Quotient: 0.8

$E3/(E1+E2)$

Patient Result



Reference Range

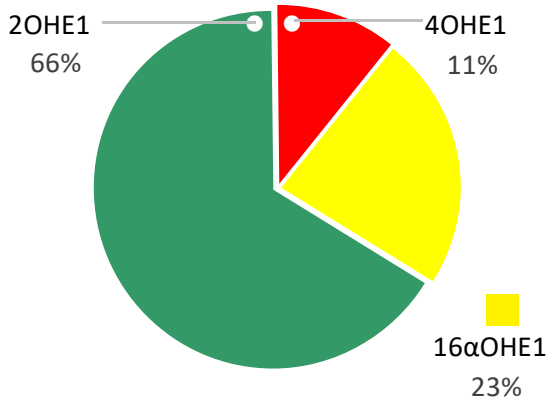
>1



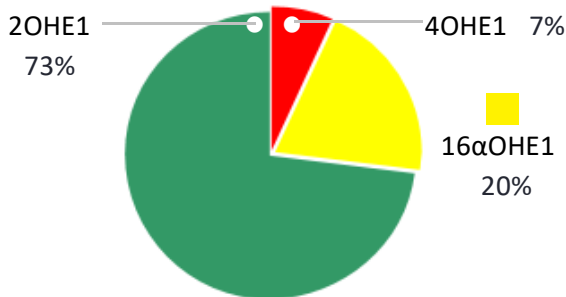
Patients with an EQ>1 have a higher survival rate after breast cancer and may be at decreased risk for developing breast cancer. EQ often declines as women enter menopause. Estriol is a less potent estrogen and is considered protective. Estradiol and Estrone are more potent for managing symptoms but have potentially carcinogenic metabolites. A healthy balance is desirable.

Estrogen Hydroxylation

Patient Result



Reference Range



This graph looks at the relative proportions of the hydroxylated (Phase I) estrogens. A high proportion does not necessarily equate to a high value, nor a low proportion to a low value. 2OHE1 is considered protective, and a larger proportion of the whole is both normal and healthy. 16αOHE1 has a strong affinity to estrogen receptors and plays an important role in maintaining bone density. Neither very high nor very low values are desirable. As a proportion of hydroxylated estrogens, up to about 20% is normal. 4OHE1 is a highly carcinogenic metabolite, and low values are desirable. As a proportion of hydroxylated estrogens, 7% or less is normal.

Methylation Ratio: 0.32

2-Methoxyestrone/2OHE1

Patient Result



Reference Range

0.2 - 0.65



The methylation ratio allows some insight into methylation pathways and Phase I to Phase II metabolism. If the methylation ratio is on the low end of the reference range, supplements that provide methyl donors and increase methylation may be helpful. Genetic testing can give additional information about methylation pathways that may allow for more targeted supplementation.

Progesterone

µg/24hr

Reference Ranges

5β-Pregnanediol (progesterone metabolite)

145

L



24-Hour PLUS Profile

Accession #:

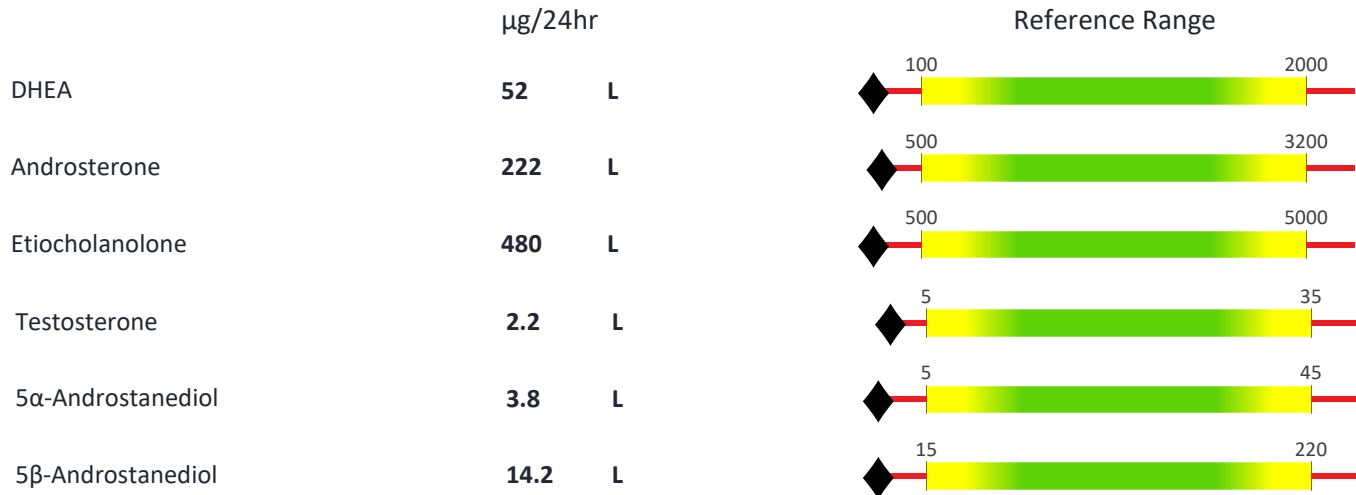
Test Code: **4080**

Sex:

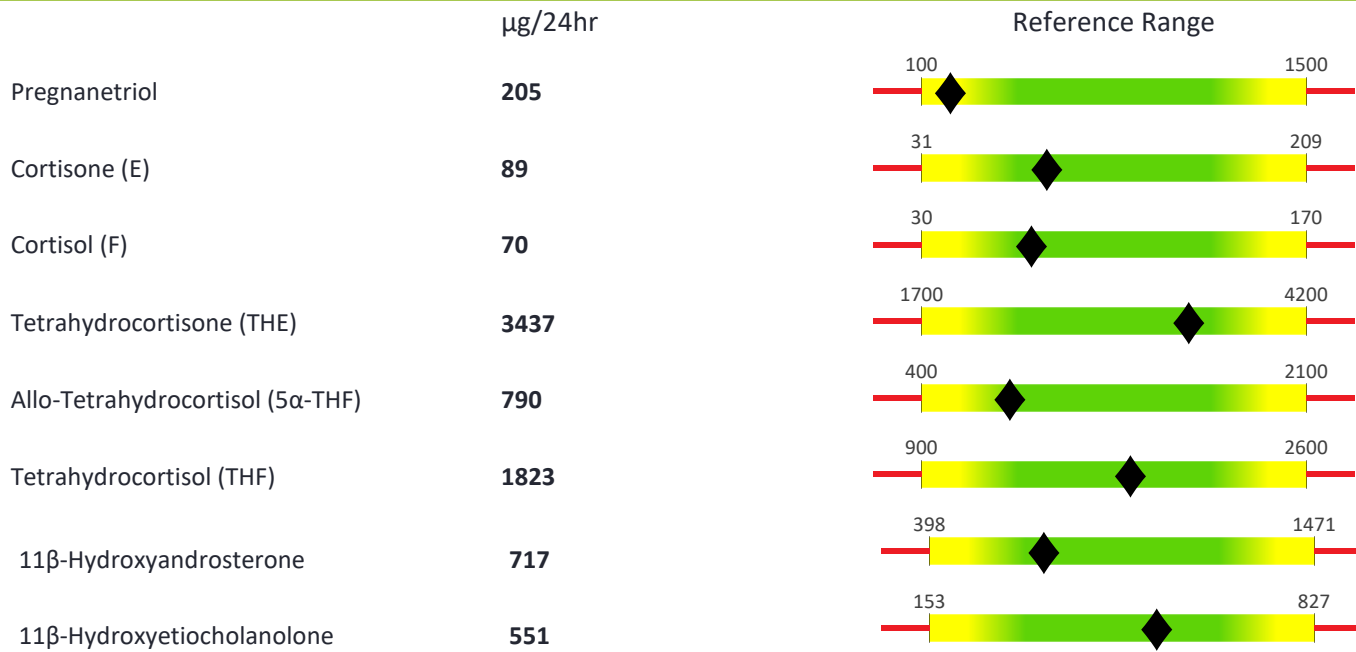
F

Patient Name:

Androgens



Glucocorticoids



Mineralcorticoids



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Enzyme Activity Phenotype Assessment

5α-Reductase

Andro/Etio Ratio **0.46**

5α-THF/THF Ratio **0.43**

Reference Range



Elevated 5α-reductase activity is associated with Polycystic Ovarian Syndrome (PCOS) and hirsutism in women, Benign Prostatic Hyperplasia (BPH) and premature baldness in men, and obesity and insulin resistance in both genders. Low 5α-reductase activity may result in reduced conversion of testosterone to DHT and undervirilization in males.¹⁻⁴

11β-HSD II (11β-hydroxysteroid dehydrogenase II)

Cortisol/Cortisone Ratio (11β-HSD I) **0.78**



11β-HSD II is predominantly a renal enzyme. It inactivates cortisol in order to prevent competitive binding to mineralocorticoid receptors. Its activity can be measured by the ratio of cortisol/cortisone. An elevated ratio (toward right on the graph) indicates suppressed enzyme activity, and may be clinically related to stress, hypertension, high dose licorice, cortisol administration, or insulin resistance.⁵

Peptide Hormones

Thyroid

Free T3 **613**

ng/24hr



Free T4 **1243**

ng/24hr



Other Analytes

Urine Minerals

Sodium **142**

mmol/24hr



Potassium **65**

mmol/24hr



Na/K Ratio **2.2**



Sodium has significant effects on blood pressure and cell to cell communication. High 24-hour urine sodium levels are commonly due to excessive dietary intake. Elevated sodium may contribute to high blood pressure and may be related to low aldosterone levels. Diuretic use and adrenal insufficiency may also contribute to high sodium levels. Low urine sodium may result from dietary restriction, GI loss (e.g., from vomiting, diarrhea), or hyperaldosteronism.¹⁻²

Potassium is important in the prevention of hypertension, in muscle contraction, and in cell to cell communication. High 24-hour urine potassium levels are uncommon and are usually due to over-supplementation or diuretic use. Hyperaldosteronism is a less common cause. Low levels may indicate low vegetable intake, use of a potassium-sparing diuretic, poor GI absorption, or GI loss.³ A **24-hour urine sodium/potassium ratio** derived from sodium and potassium values falling midpoint to their reference ranges (i.e.: around 1.5) is considered a healthy balance between these two electrolytes. Comparison to sodium and potassium blood levels may provide additional clinical insight.

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Chronic Disease Risk Factors

Metabolic Disease

Kynurenic Acid	1.8	mg/24hr	
Xanthurenic Acid	0.61	mg/24hr	

Kynurenic Acid and **Xanthurenic Acid** are products of tryptophan metabolism that rise in relation to levels of stress and inflammation in the body. High urinary levels may be an early warning sign for vitamin B6 deficiency, metabolic syndrome (insulin resistance) or type II diabetes, which increase the risk of cardiovascular disease, dementia, and other chronic diseases.^{1,2} Protein-restricted diets or malabsorption may result in lower levels.

For Further Information and Interpretations

Clinicians are encouraged to schedule a free consultation with one of our staff physicians. This service is available with every test. Consultations are usually available within 1-2 business days. Short technical questions can usually be answered the same day.

To schedule a consult, call **855.405.TEST(8378)**.

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Patient Name:

References

Enzyme Activity

1. Graupp M, et al. (2011). Association of genetic variants in the two isoforms of 5 α -reductase, SRD5A1 and SRD5A2, in lean patients with polycystic ovary syndrome. *European Journal of Obstetrics & Gynecology and Reproductive Biology*, 157(2): 175-179. DOI: [10.1016/j.ejogrb.2011.03.026](https://doi.org/10.1016/j.ejogrb.2011.03.026)
2. Issa MM, Kraft KH. (2007). 5 α -reductase inhibition for men with enlarged prostate. *Journal of the American Academy of Nurse Practitioners*, 19(8): 398-407. DOI: [10.1111/j.1745-7599.2007.00243.x](https://doi.org/10.1111/j.1745-7599.2007.00243.x)
3. Tomlinson JW, et al. (2008). Impaired glucose tolerance and insulin resistance are associated with increased adipose 11 β -hydroxysteroid dehydrogenase type 1 expression and elevated hepatic 5 α -reductase activity. *Diabetes*, 57(10): 2652-2660. DOI: [10.2337/db08-0495](https://doi.org/10.2337/db08-0495)
4. Traish AM. (2012). 5 α -reductase in human physiology: An unfolding story. *Endocrine Practice*, 18(6): 965-975. DOI: [10.4158/ep12108.ra](https://doi.org/10.4158/ep12108.ra)
5. Yokokawa A, et al. (2012). The effect of water loading on the urinary ratio of cortisone to cortisol in healthy subjects and a new approach to the evaluation of the ratio as an index for *in vivo* human 11 β -hydroxysteroid dehydrogenase 2 activity. *Steroids*, 77(12): 1291-1297. DOI: [10.1016/j.steroids.2012.07.008](https://doi.org/10.1016/j.steroids.2012.07.008)

Urine Minerals

1. Braun MM, et al (2015). Diagnosis and management of sodium disorders: Hyponatremia and hypernatremia. *American Family Physician*, 91(5):299-307. <https://www.aafp.org/afp/2015/0301/p299.pdf>
2. Feng JH, et al. (2013). Effect of longer term modest salt reduction on blood pressure: Cochrane systematic review and meta-analysis of randomized trials. *BMJ*, 3; 346: f1325. DOI: [10.1136/bmj.f1325](https://doi.org/10.1136/bmj.f1325)
3. Viera AJ, et al (2015). Potassium disorders: Hypokalemia and hyperkalemia. *American Family Physician*, 92(6): 487-495. <https://www.aafp.org/afp/2015/0915/p487.pdf>

Metabolic Disease

1. Oxenkrug G, et al. (2013). Kynurenines and vitamin B6: Link between diabetes and depression. *Journal of Bioinformatics and Diabetes*, 1(). DOI: [10.14302/issn.2374-9431.jbd-13-218](https://doi.org/10.14302/issn.2374-9431.jbd-13-218)
2. Badawy AA. (2017). Kynurenine pathway of tryptophan metabolism: Regulatory and functional aspects. *International Journal of Tryptophan Research*, 10: 1-20. DOI: [10.1177/1178646917691938](https://doi.org/10.1177/1178646917691938)