

Urine Hormone Interpretation Guide - References

1. Zhu, Han, *et al.* Quantitative structure-activity relationship of various endogenous estrogen metabolites for human estrogen receptor alpha and beta subtypes: Insights into the structural determinants favoring a differential subtype binding. *Endocrinology*, 2006 147:4132-4150
2. Maehle BO, *et al.* Estrogen receptor beta – an independent prognostic marker in estrogen receptor alpha and progesterone receptor-positive breast cancer? *APMIS*. 2009. Sep;117(9):644-50.
3. Imanov O, *et al.* Estrogen receptor in health and disease. *Biol Reproduct*. 2005. 73(5):866-71.
4. Mishra RG, *et al.* Metabolite ligands of estrogen receptor-beta reduce primate hyperreactivity. *Am J physiol*. 2006;290(1):H295-303.
5. Wright JV. Bio-identical steroid hormone replacement: selected observations from 23 years of clinical and laboratory practice. *Ann NY Acad Sci*. 2005 Dec;1057:506-24.
6. Lemon HM, *et al.* Reduced estriol excretion in patients with breast cancer prior to endocrine therapy. *JAMA*. 1966 June 27;196(13):1128-36.
7. Wright JV, *et al.* Comparative measurements of serum estriol, estradiol, and estrone in non-pregnant, pre-menopausal women: a preliminary investigation. *Alt Med Rev*. 1999 4(4):266-270.
8. Ciapauch, *et al.* Total estradiol, rather than testosterone levels, predicts osteoporosis in aging men. *Arg Pras Endocrinol Metab*. 2009;53/8: 1020-1025.
9. Kacker R, *et al.* Estrogens in men: clinical implications for sexual function and the treatment of testosterone deficiency. *J Sex Med*. 2012 Jun;9(6):1681-96.
10. Fukui, Kitagawa, *et al.* Association between serum estradiol concentrations and carotid atherosclerosis in men with type 2 diabetes mellitus. *Metabolism Clinical and Experimental* 57 (2008) 285-289.
11. Kapoor D, *et al.* Androgens insulin resistance and vascular disease in men. *Clin Endocrinol*. 2005. 63(3):239-50.
12. Ding EL, *et al.* Sex Differences of Endogenous Sex hormones and Risk of Type 2 Diabetes, A Systemic Review and Meta-analysis. *JAMA*, March 15, 2006 1288-1299.
13. Maggio M, *et al.* Association between hormones and metabolic syndrome in older Italian men. *J Am Geriatr Soc*. 2006 December; 54(12): 1832-1838.
14. Hammoud, Carrel, *et al.* An aromatase polymorphism modulates the relationship between weight and estradiol levels in obese men. *Fertility and Sterility*, 2009.

15. Telang NT, *et al.* Induction by estrogen metabolite 16 alpha-hydroxyestrone of genotoxic damage and aberrant proliferation in mouse mammary epithelial cells. *J Natl Cancer Inst.* 1992; 84 (8): 634-638.
16. Jernstrom H, *et al.* Predictor of the plasma ratio of 2-hydroxyestrone to 16(alpha)-hydroxyestrone among pre-menopausal, nulliparous women from four ethnic groups. *Carcinogenesis.* 2003;24(5):991-1005.
17. Bradlow HL, Davis DL, Lin G, Sepkovic D, Tiwari R. Effects of pesticides on the ratio of 16 alpha/2-hydroxyestrone: a biologic marker of breast cancer risk. *Environ Perspect.* 1995; 103 (Suppl 7): 147-150.
18. Lim SK, Won YJ, Lee JH, *et al.* Altered hydroxylation of estrogen in patient with postmenopausal osteopenia. *J Clin Endocrinol Metab.* 1997; 82(4):1001-6.
19. Lotinun S, *et al.* Tissue selective effects of continuous release of 2-hydroxyestrone and 16alpha-hydroxyestrone on bone, uterus and mammary gland in ovariectomized growing rats. *J Endocrinol.* 2001. 170(1):165-74.
20. Kabat GC, O'Leary ES, Gammon MD, *et al.* Estrogen metabolism and breast cancer. *Epidemiology* 2006; 17 (1): 80-8.
21. Fuhrman BJ, *et al.* Estrogen metabolism and the risk of breast cancer in postmenopausal women. *J Natl Cancer Inst.* 2012. Feb 22;104(4):326-39.
22. Falk RT, *et al.* Relationship of serum estrogens and estrogen metabolites to postmenopausal breast cancer: a nested case-control study. *Breast Cancer Res.* 2013. Apr 22;15(2):R34.
23. Dalessandri KM, *et al.* Pilot study: Effect of 3,3'-diindolymethane supplements on urinary hormone metabolites in postmenopausal women with a history of early-stage breast cancer. *Nutrition and Cancer.* 2004. 50(2):161-7.
24. Anderson, *et al.* Nutrition and epigenetics: an interplay of dietary methyl donors, one-carbon metabolism and DNA methylation. *J Nutr Biochem.* 2012 Aug;23(8):853-9.
25. Cavalieri E, Rogan E. Depurinating estrogen-DNA adducts, generators of cancer initiation: their minimization leads to cancer prevention. *Clin Transl Med.* 2016; 5(1): 12.
26. <http://www.genecards.org/cgi-bin/carddisp.pl?gene=COMT&search=COMT>
27. Newman, S.P., M.P. Leese, *et al.* Inhibition of in vitro angiogenesis by 2 methoxy and 2 ethyl-estrogen sulfamates. *Int J Cancer,* 2004, 109(4):533-40.
28. Sweeney, C., G. Liu, *et al.* A phase II multicenter, randomized, double-blind, safety trial assessing the pharmacokinetics, pharmacodynamics, and efficacy of oral 2-methoxyestradiol capsules in hormone-refractory prostate cancer. *Clini Cancer Res.* 2005, 11(8);6625-33.
29. Raobaikady, *et al.* Novel therapy with 2 methoxyestradiol for the treatment of relapsed and plateau phase multiple myeloma. *Clini Cancer Res,* 2007, 13(20):6162-7.

30. Clinical observation
31. Lakhani NJ, *et al.* 2-Methoxyestradiol, a promising anticancer agent. *Pharmacotherapy*. 2003. Feb;23(2):165-72.
32. Kuo, *et al.* 2-methoxyestradiol induces mitotic arrest, apoptosis, and synergistic cytotoxicity with arsenic trioxide in human urothelial carcinoma cells. *PLoS One*. 2013 Aug 13;8(8):e68703.
33. Wang G, *et al.* Quercetin synergizes with 2-methoxyestradiol inhibiting cell growth and inducing apoptosis in human prostate cancer cells. *Oncol Rep*. 2013 Jul;30(1):357-63
34. Choi HJ, *et al.* Critical role of cyclin B1/Cdc2 up-regulation in the induction of mitotic prometaphase arrest in human breast cancer cells treated with 2-methoxyestradiol. *Biochim Biophys Acta*. 2012 Aug;1823(8):1306-15.
35. Munro CJ, *et al.* Relationship of serum estradiol and progesterone concentrations to the excretion profiles of their major urinary metabolites as measured by enzyme immunoassay and radioimmunoassay. *Clin Chem*. 1991 Jun;37(6):838-44.
36. Ghebre MA *et al.* Association between DHEAS and bone loss in postmenopausal women: a 15-year longitudinal population-based study. *Calcif Tissue Int*. 2011 Oct;89(4):295-302.
37. Morgan CA 3rd, *et al.* Relationships among plasma dehydroepiandrosterone and dehydroepiandrosterone sulfate, cortisol, symptoms of dissociation, and objective performance in humans exposed to underwater navigation stress. *Biol Psychiatry*. 2009 Aug 15;66(4):334-40.
38. Bovenberg SA, *et al.* Dehydroepiandrosterone administration in humans: evidence based? *Neth J Med*. 2005 Sep;63(8):300-4.
39. Traish AM, *et al.* Dehydroepiandrosterone (DHEA) – a precursor steroid or an active hormone in human physiology. *J Sex Med*. 2011 Nov;8(11):2960-82.
40. Savineau JP, *et al.* Role of DHEA in cardiovascular diseases. *Biochem Pharmacol*. 2013 Mar 15;85(6):718-26.
41. Sundar J, *et al.* Can dehydroepiandrosterone (DHEA) target PRL-3 to prevent colon cancer metastasis? *Med Hypothesis*. 2013 May;80(5):595-7.
42. Enomoto M, *et al.* Serum dehydroepiandrosterone sulfate levels predict longevity in men: 27-year follow-up study in a community-based cohort (Tanushimaru study). *J Am Geriatr Soc*. 2008 Jun;56(6):994-8.
43. Tyagi V, Scordo M, Yoon R, Liporace F, Greene L. Revisiting the role of testosterone: Are we missing something? *Rev Urol*. 2017 vol: 19 (1) pp: 16
44. Michaud J, Billups K, Partin A. Testosterone and prostate cancer: an evidence-based review of pathogenesis and oncologic risk. *Ther Adv Urol*. 2015; 7(6): 378-87.

45. Sawaya ME, Price VH. Different levels of 5alpha-reductase type I and II, aromatase, and androgen receptor in hair follicles of women and men with androgenetic alopecia. *J Invest Dermatol.* 1997 Sep;109(3):296-300.
46. Swerdloff R, Dudley R, Page S, Wang C, Salameh W. Dihydrotestosterone: Biochemistry, Physiology, and Clinical Implications of Elevated Blood Levels. *Endocrine Rev.* 2017; 38(3): 220-254.
47. Dozmorov M Yang Q Matwalli A Hurst R Culkin D, *et al.* 5 α -androstane-3 α ,17 β -diol selectively activates the canonical PI3K/AKT pathway: a bioinformatics-based evidence for androgen-activated cytoplasmic signaling. *Genomic Medicine.* 2007; 1(3-4): 139-46.
48. Toscano V, Sciarra F, Adamo MV, Petrangeli E, Foli S, Caiola S, Conti C. Is 3 alpha-androstanediol a marker of peripheral hirsutism? *Acta Endocrinol (Copenh).* 1982 Feb;99(2):314-20.
49. Nomura A, Stemmermann G, Chyou P, Henderson B, Stanczyk F. Serum androgens and prostate cancer. *Cancer Epidemiol Biomarkers Prev.* 1996; 5(8): 621-5.
50. Simonian MH. ACTH and thyroid hormone regulation of 3 beta-hydroxysteroid dehydrogenase activity in human fetal adrenocortical cells. *J Steroid Biochem.* 1986 Dec;25(6):1001-6.
51. Dauber A, *et al.* Monitoring of therapy in congenital adrenal hyperplasia. *Clin Chem.* 2010 Aug;56(8):1245-51.
52. Clinical observation
53. Burtis CA, *et al.* *Tietz Textbook of Clinical Chemistry.* 3rd ed. Philadelphia, PA W.B. Saunders Company; 1999.
54. Tomlinson J, *et al.* 11 β -hydroxysteroid dehydrogenase type 1: A tissue specific regulator of glucocorticoid response. *Endocrine Reviews.* 2004. 25(5);831-866.
55. Jerjes WK, *et al.* Urinary cortisol and cortisol metabolite excretion in chronic fatigue syndrome. *Psychosom. Med.* 2006;68(4):578–82.
56. He FJ, *et al.* Effect of longer term modest salt reduction on blood pressure: Cochrane systematic review and meta-analysis of randomized trials. *BMJ* 2013 April 3; 346:f1325.
57. Nappi JM, *et al.* Aldosterone and aldosterone receptor antagonists in patients with chronic heart failure. *Vasc Health Risk Manag.* 2011;7:353-63.
58. Molitch ME, *et al.* Evaluation and treatment of adult growth hormone deficiency: an Endocrine Society Clinical Practice Guideline. *J Clin Endocrinol Metab.* 2011 Jun;96(6):1587-609.
59. Liu, Bravata, *et al.* Systemic Review: the safety and efficacy of growth hormone in the healthy elderly. *Ann Intern Med.* 2007 146(2):104-15.

60. Barake M, *et al.* Effects of recombinant human growth hormone therapy on bone mineral density in adults with growth hormone deficiency: a meta-analysis. *J Clin Endocrinol Metab.* 2014 Mar;99(3):852-60.
61. Gola M, *et al.* Clinical review: Growth hormone and cardiovascular risk factors. *J Clin Endocrinol Metab.* 2005 Mar;90(3):1864-70.
62. Vielma JR, *et al.* Effects of melatonin on oxidative stress, and resistance to bacterial, parasitic and viral infections: A review. *Acta Trop.* 2014 Sep;137C:31-38.
63. Kovacs J, *et al.* Measurement of urinary melatonin: A useful tool for monitoring serum melatonin after its oral administration. *J Clin Endocrinol Metab.* 2000;85(2):666-70.
64. Cardoso C, *et al.* Intranasal oxytocin attenuates the cortisol response to physical stress: a dose-response study. *Psychoneuroendocrinology.* 2013 Mar;38(3):399-407.
65. Linnen AM, *et al.* Intranasal oxytocin and salivary cortisol concentrations during social rejection in university students. *Stress.* 2012. Jul;15(4):393-402.
66. Ray K. Pain. Oxytocin analogues have potential in relieving chronic abdominal pain. *Nat Rev Gastroenterol Hepatol.* 2014 Apr;11(4):202.
67. Mikolajczak M, *et al.* Oxytocin not only increases trust when money is at stake, but also when confidential information is in the balance. *Biol Psychol.* 2010 Sep;85(1):182-4.
68. MacDonald K, Feifel D. Dramatic improvement in sexual function induced by intranasal oxytocin. *J Sex Med.* 2012;9:1407-1410.
69. IsHak WW, *et al.* Male anorgasmia treated with oxytocin. *J Sex Med.* 2008;5:1022-1024.
70. Elabd C, *et al.* Oxytocin is an age-specific circulating hormone that is necessary for muscle maintenance and regeneration. *Nat Commun.* 2014 Jun 10;5:4082.
71. Altirriba, J., Poher, A.-L., & Rohner-Jeanrenaud, F. (2015). Chronic Oxytocin Administration as a Treatment Against Impaired Leptin Signaling or Leptin Resistance in Obesity. *Frontiers in Endocrinology*, 6, 119.
72. Oxenkrug G, Ratner R, Summergrad P. Kynurenines and vitamin B6: link between diabetes and depression. *Journal of Bioinformatics and Diabetes* 2013 vol: 1 (1).
73. Cotton N, Stoddard B, Parson W. Oxidative inhibition of human soluble catechol-O-methyltransferase. *The Journal of Biological Chemistry* 2004 vol: 279 (22) pp: 23710-8.
74. Badawy AA. *Kynurenine Pathway of Tryptophan Metabolism: Regulatory and Functional Aspects.* International journal of tryptophan research : IJTR 2017 vol: 10 pp: 1178646917691938.
75. Breuil, V., Amri, E.-Z., Panaia-Ferrari, P., *et al.* (2011). Oxytocin and bone remodelling: relationships with neurohypothalamic hormones, bone status and body composition. *Joint, Bone, Spine : Revue Du Rhumatisme*, 78(6), 611–5.

65. Baisier WV, *et al.* Thyroid insufficiency. Is TSH measurement the only diagnostic tool? *J Nutr Environ Med.* 2000;(10):105-113.
76. Kwok TC, *et al.* Relationship of urinary sodium/potassium excretion and calcium intake to blood pressure and prevalence of hypertension among older Chinese vegetarians. *Eur J Clin Nutr.* 2003 Feb; 57(2):299-304.
77. Burnett AL. The role of nitric oxide in erectile dysfunction: implications for medical therapy. *J Clin Hypertens (Greenwich).* 2006 Dec;8(12 Suppl 4):53-62.
78. Lei J, *et al.* Nitric oxide, a protective molecule in the cardiovascular system. *Nitric Oxide.* 2013 Nov 30;35:175-85.
79. Chen, *et al.* Effect of oral administration of high-dose nitric oxide donor L-arginine in men with organic erectile dysfunction: results of a double-blind, randomized, placebo-controlled study. *BJU Int.* 1999; 83(3): 269-73.
80. Padilla, *et al.* Nitric Oxide and Malondialdehyde in Human Hypertension. *Am J Thera.* 2007;14: 172-176.
81. Machha and Schechter. Dietary nitrite and nitrate: a review of potential mechanisms of cardiovascular benefits. *Eur J Nutr.* 2011 August; 50(5):293-303.
82. Wu, M. Arginine metabolism: nitric oxide and beyond. *Biochem J.* 1998;336:1-17.
83. Schwedhelm E, Maas R, Freese R, *et al.* Pharmacokinetic and pharmacodynamics properties of oral L-citrulline and L-arginine: impact on nitric oxide metabolism. *Br J Clin Pharmacol.* 2008;65:51-59.
84. Pizzorno L. L-citrulline: Restoring erectile function (Viagra doesn't). 2011. Accessed online : <http://www.lmreview.com/articles/view/l-citrulline-restoring-erectile-function-viagra-doesnt/>
85. Lidder S, *et al.* Vascular effects of dietary nitrate (as found in green leafy vegetables and beetroot) via the nitrate-nitrite-nitric oxide pathway. *Br J Clin Pharmacol.* 2013 Mar;75(3): 677-96.
86. Golbidi S, *et al.* Exercise and the aging endothelium. *J Diabetes Res.* 2013;2013:789607.
87. Ohta M, *et al.* Effects of bench step exercise on arterial stiffness in post-menopausal women: contribution of IGF-1 bioactivity and nitric oxide production. *Growth Horm IGF Res.* 2012 Feb; 22(1):36-41.
88. Issa MM, *et al.* 5alpha-reductase inhibition for men with enlarged prostate. *J Am Acad Nurse Pract.* 2007 Aug; 19(8):398-407.
89. Traish AM. 5a-reductases in human physiology: an unfolding story. *Endocr Pract.* 2012 Nov-Dec;18(6):965-75.

90. Graupp M, *et al.* Association of genetic variants in the two isoforms of 5 α -reductase, SRD5A1 and SRD5A2, in lean patients with polycystic ovary syndrome. *Eur J Obstet Gynecol Reprod Biol.* 2011 Aug;157(2):175-9.
91. Tomlinson JW, *et al.* 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.* 2008 Oct;57(10):2652-60.
92. Irwig MS, *et al.* Persistent sexual side effects of finasteride for male pattern hair loss. *J Sex Med.* 2011;8:1747-1753.
93. Chapman K, Holmes M, Seckl J. 11 β hydroxysteroid dehydrogenases: intracellular gatekeepers of tissue glucocorticoid action. *Physiol Rev.* 2013 Jul; 93(3): 1139-206.
94. M Quinkler, *et al.* Clinical implications of glucocorticoid metabolism by 11 β -hydroxysteroid dehydrogenases in target tissues. *European Journal of Endocrinology* 2001 144 87-97.
95. Tomlinson JW, *et al.* Cortisol metabolism and the role of 11 β hydroxydehydrogenase. *Best Practice & Research Clinical Endocrinology and Metabolism Vol. 15, No. 1, pp. 61-78, 2001.*
96. Kotelevtsec Y, *et al.* 11 β -hydroxysteroid dehydrogenase type I knock out mice show attenuated glucocorticoid-inducible responses and resist hyperglycemia on obesity or stress. *PNAS, 1997; 94: 14924-14929.*
97. Gambineri A, *et al.* Tissue –specific dysregulation of 11 β -hydroxysteroid dehydrogenase type 1 in overweight/obese women with polycystic ovary syndrome compared with weight-matched controls. *Eur J Endocrinol.* 2014 Jul;171(1):47-57.