Estrogen Metabolites; urine

Order: 999999-9999

Test: X999999-9999-1
Client #: 999999
Doctor: Sample Doctor, MD
Doctors Data Inc
123 Main St.
St. Charles, IL 60174 USA
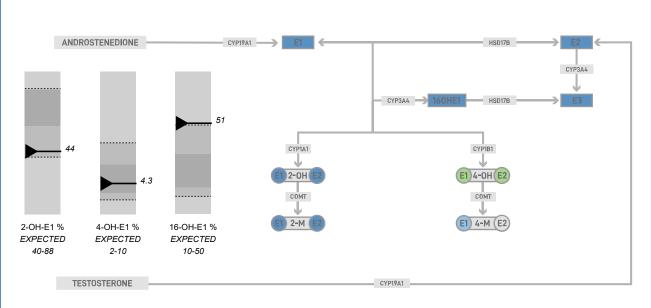
Patient: Sample Patient
Id: 999999
Age: 72   **DOB:** 01/01/1952
Sex: Female
Menopausal Status: Post-menopausal , , Hysterectomy,

Sample Collection
Collection Period
Date Received
Date Reported

Date/Time
Multipoint daily
11/13/2024
11/21/2024

2-OH-E1 %
EXPECTED
40-88   →44

4-OH-E1 %
EXPECTED
2-10   →4.3

16-OH-E1 %
EXPECTED
10-50   →51

Estrogens		Result	Unit	L	WRI	H	Reference Interval
Estrone‡	(E1)	0.66	ng/mg Creat/Day				1.5 – 4.4
2-Hydroxyestrone‡	(2-OH-E1)	0.28	ng/mg Creat/Day				1.6 – 6.5
4-Hydroxyestrone‡	(4-OH-E1)	0.027	ng/mg Creat/Day				0.0 – 0.3
16α-Hydroxyestrone‡	(16-OH-E1)	0.33	ng/mg Creat/Day				0.5 – 5.3
2-Methoxyestrone‡	(2-M-E1)	0.068	ng/mg Creat/Day				0.4 – 3.2
4-Methoxyestrone‡	(4-M-E1)	0.003	ng/mg Creat/Day				0.003 – 0.05
Estradiol‡	(E2)	0.13	ng/mg Creat/Day				0.2 – 1.5
2-Hydroxyestradiol‡	(2-OH-E2)	0.027	ng/mg Creat/Day				0.03 – 0.29
4-Hydroxyestradiol‡	(4-OH-E2)	0.001	ng/mg Creat/Day				0.0 – 0.30
2-Methoxyestradiol‡	(2-M-E2)	0.002	ng/mg Creat/Day				0.02 – 0.20
Estriol‡	(E3)	0.49	ng/mg Creat/Day				1.0 – 5.4

Notes:

WRI – Within Reference Interval - represented by bracket and stated ranges on report, Dark Blue = Below RI, Light Blue = WRI low, Green = Optimal, Yellow = WRI high, Red = Above RI, <dl = result below detection limit

‡This test was developed and its performance characteristics determined by Doctor's Data Laboratories in a manner consistent with CLIA requirements. The U.S. Food and Drug Administration (FDA) has not approved or cleared this test; however, FDA clearance is not currently required for clinical use.
Methodology: LCMS QQQ

Estrogen Metabolites; urine

Ratios and Calculations		Result	Unit	L	WRI	H	Reference Interval
2-OH-E1 %‡	(2-OH-E1 %)	44	%				40 – 88
4-OH-E1 %‡	(4-OH-E1 %)	4.3	%				2 – 10
16-OH-E1 %‡	(16-OH-E1 %)	51	%				10 – 50
2-M-E1:2-OH-E1‡	(COMT/Methylation activity)	0.23					0.08 – 0.60
2-M-E2:2-OH-E2‡	(COMT/Methylation activity)	0.085					0.06 – 0.80
4-M-E1:4-OH-E1‡	(COMT/Methylation activity)	0.091					0.004 – 0.10
2-OH-E1:16-OH-E1 ‡		0.87					≥ 0.60
4-OH-E1:2-OH-E1‡		0.096					0.00 – 0.17

Creatinine	Result	Unit	L	WRI	H	Reference Interval
Creatinine/day	112	mg/dL/Day				30 – 225

Estrogen Metabolites Information

Evaluation of the estrogen metabolism pathway relies on understanding several key steps of metabolism: the amount of unconjugated estrogens, hydroxylation of E1 and E2 (phase I), methylation of hydroxy estrogens (phase II), and the function of key enzymes. Estrogen is metabolized down three phase I pathways: 2-OH (considered the safest), 4-OH (considered the most genotoxic), and 16-OH (considered the most estrogenic). In phase II, estrogens are methylated, making them less reactive and ready for excretion. The ratio of 4-M E1/E2 to 4-OH E1 / 2 and 2-M E1/E2 to 2-OH E1/E2 can help determine if adequate methylation of catechol estrogens is occurring. The higher the ratio, the higher the likelihood of metabolizing toward the pathway with lower harm potential, and therefore less reactive quinone formation. Even if 4-OH metabolites are elevated, adequate methylation can indicate these metabolites are being detoxified, rendering them potentially less harmful.

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Estrogens

Estrone (E1)

Low values have not been shown to be associated with negative health effects.

2-Hydroxyestrone (2-OH-E1)

Adequate levels of 2-OH-E1 have been shown to be a favorable marker for breast health. Low levels of 2-OH E1 may be due to low levels of estrone, or more active CYP3A4 or CYP1B1 enzymes. Increasing the activity of CYP1A1 to increase 2-OH-E1 is a consideration.

16α-Hydroxyestrone (16-OH-E1)

Lower levels of 16-OH-E1 are associated with lower neoplastic risk, and potentially a higher risk of low bone density. Low levels may be due to low levels of unconjugated estrogens.

2-Methoxyestrone (2-M-E1)

2-M-E1 is considered a non-reactive metabolite. Lower levels indicate possible carcinogenic potential and other negative markers of breast health in females. A genetic variant of the MTHFR enzyme may contribute to decreased methylation. If a variant is suspected, further evaluation may be warranted.

Estradiol (E2)

Low estradiol levels may reflect deficient hormone production, suppressed ovarian function (anovulation) or excessive hormone metabolism. Confirmation of low endogenous levels via saliva or serum may be warranted.

2-Hydroxyestradiol (2-OH-E2)

Adequate levels of 2-OH-E2, the "safer" estrogen metabolite, have been shown to be a marker for breast health. Low levels of 2-OH-E2 may be due to low levels of estradiol, estrone, or more active CYP34A or CYP1B1 enzymes. Increasing the activity of CYP1A1 to increase 2-OH-E1 is a consideration.

2-Methoxyestradiol (2-M-E2)

2-M-E2 is considered a non-reactive metabolite. Lower levels have been associated with neoplastic risk and other negative markers of breast health in women. Supporting the COMT enzyme (methylation) is a consideration.

Estriol (E3)

The low estriol level may be due to decreased conversion from estrone, estradiol and/or 16-OH-E1. In females, lower estriol levels may be associated with vaginal dryness. Supplementation with estriol is a consideration.