Lab Dept: Chemistry

Test Name: ESTRADIOL

General Information

Lab Order Codes: EEST

Synonyms: N/A

CPT Codes: 82670 – Estradiol

Test Includes: Estradiol level reported in pg/mL.

Logistics

Test indications:
● Evaluation of hypogonadism and olig-ameorrhea in females.
● Assessing ovarian status, including follicle development, for assisted reproduction protocols (eg, in vitro fertilization).
● In conjunction with luteinizing hormone measurements, monitoring of estrogen replacement therapy in hypogonadal premenopausal women.
● Evaluation of feminization, including gynecomastia, in males
● Diagnosis of estrogen-producing neoplasms in males and females
● As part of the diagnosis and workup of suspected disorders of sex steroid metabolism (eg, aromatase deficiency and 17 alpha-hydroxylase deficiency)
● As an adjunct to clinical assessment, imaging studies and bone mineral density measurement in the fracture risk assessment of postmenopausal women
● Monitoring antiestrogen therapy (eg, aromatase inhibitor therapy)

Lab Testing Sections: Chemistry - Sendouts

Referred to: Mayo Clinic Laboratories – (Mayo Test: EEST)

Phone Numbers: MIN Lab: 612-813-6280

STP Lab: 651-220-6550

Test Availability: Daily, 24 hours

Turnaround Time: 2-4 days

Special Instructions: N/A

Specimen

Specimen Type: Blood

Container:	Red NO GEL tube
Draw Volume:	3.6 mL (Minimum: 2.4 mL) blood
Processed Volume:	1.2 mL (Minimum: 0.8 mL) serum
Collection:	Routine blood collection
Special Processing:	Lab Staff: Centrifuge specimen, remove serum aliquot into a plastic screw-capped vial. Store and ship refrigerated.
Patient Preparation:	N/A
Sample Rejection:	Specimens collected in gel tubes; mislabeled or unlabeled specimens

Interpretive

Reference Range:

Children 1-14 days: Estradiol levels in newborns are very elevated at birth but fall to prepubertal levels within a few days.

Males

Tanner Stage	Mean Age	Reference Range (pg/mL)
Stage I (>14 days and prepubertal)	7.1 years	Undetectable - 13
Stage II	12.1 years	Undetectable - 16
Stage III	13.6 years	Undetectable - 26
Stage IV	15.1 years	Undetectable – 38
Stage V	18 years	10 - 40
Adults:		10 - 40

Females

Tanner Stage	Mean Age	Reference Range (pg/mL)
Stage I (>14 days and prepubertal)	7.1 years	Undetectable - 20
Stage II	10.5 years	Undetectable – 24
Stage III	11.6 years	Undetectable - 60

Stage IV	12.3 years	15 - 85
Stage V	14.5 years	15 – 350 E2 levels vary widely through the menstrual cycle
Adult	Premenopausal	15 – 350 E2 levels vary widely through the menstrual cycle
	Postmenopausal	<10

Critical Values: N/A

Limitations: Fulvestrant is a member of a new class of drugs call “selective estrogen receptor degraders (SERDS). Fulvestrant has modest cross-reactivity (1-5%) in estradiol immunoassays, but because the peak dose levels of this drug are between 10-fold (reproductive age women) and greater than 200-fold (postmenopausal women) higher than the naturally circulating estradiol concentrations in the treated women, this causes dramatically false-high estradiol results in immunoassays, when blood sampling occurs in close temporal proximity of dosing.

By contrast, estradiol measurements by mass spectrometry disply greater than 1000-fold lower cross reactivity (<0.001%), meaning that the impact of Fulvestrant on serum estradiol measurements by mass spectrometry is negligible, even if blood sampling occurs at peak dose.

Methodology: Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS)

References: Mayo Clinic Laboratory (January 2021)