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 (e.g., 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 (e.g., 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 (e.g., 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:	2-6 days
Special Instructions:	N/A

Specimen

Specimen Type:	Blood

Container: Red NO GEL tube

Draw Volume: 3.6 mL (Minimum: 2.1 mL) blood

Processed Volume: 1.2 mL (Minimum: 0. 7mL) serum

Collection: Routine blood collection

Special Processing: Lab Staff: Centrifuge specimen within 2 hours of collection, remove serum aliquot into a plastic screw-capped vial. Store and ship refrigerated.

Specimen stable for 28 days refrigerated (preferred), frozen or ambient.

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 display 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 December 2024

Updates: 12/27/2024: Added specimen stability, edited minimum volumes and turnaround time.

1/20/2025: Added recommendation to centrifuge specimen within two hours of collection.