
Lab Dept: Chemistry

Test Name: ESTRADIOL

General Information

Lab Order Codes: ETDI

Synonyms: 17-Beta estradiol

CPT Codes: 82670 - Estradiol

Test Includes: Estradiol level reported in pg/mL.

Logistics

Test Indications: Estradiol provides indication of ovarian function. It may be useful to evaluate infertility, menstrual irregularities, and sexual precocity in females. Other conditions causing elevations include the polycystic ovary syndrome and feminizing tumors of the ovary or adrenals. Ovarian failure, hypogonadism, and Turner syndrome cause decreased levels. In males, estradiol may be useful to evaluate feminizing states. Oral contraceptives lower estradiol levels and clomiphene will increase them.

Estradiol measurements, in conjunction with gonadotropin levels, can be used to categorize amenorrhea syndromes, including anorexia nervosa. In premature ovarian failure, low serum or urine estrogens are accompanied by increased FSH and LH, in contrast to levels seen with hypothalamic or pituitary disease. Estradiol levels are very low in gonadal dysgenesis, and may be very high in hormonally active ovarian neoplasms. Estradiol augments the amplitude of prolactin pulsatile secretion. Very high serum estradiol levels are not detrimental to clinical outcome of in vitro fertilization.

Lab Testing Sections: Chemistry (Performed on Minneapolis Campus)

Phone Numbers: MIN Lab: 612-813-6280

STP Lab: 651-220-6550

Test Availability: Daily, 24 hours

Turnaround Time: 1 – 6 hours

Special Instructions: N/A

Specimen

Specimen Type: Blood

Container: SST (Marble or gold, or red)

Draw Volume: 1.2 mL (Minimum: 0.6 mL) blood

Processed Volume: 0.4 mL (Minimum: 0.2 mL) serum

Note: Submission of the minimum volume does not allow for repeat analysis.

Collection: Routine blood collection

Special Processing: Lab Staff: Centrifuge specimen within 1 hour of collection. Remove serum aliquot into a screw-capped plastic vial. Do not exceed 24 hours at room temperature. Forward promptly.

Patient Preparation: None

Sample Rejection: Mislabeled or unlabeled specimens

Interpretive

Reference Range:

Puberty:	Male	Female
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Tanner Stage	Mean Age (years)	Estradiol pg/mL	Mean Age (years)	Estradiol pg/mL
1	>14 days & prepubertal	0 – 19	>14 days & prepubertal	0 – 20
2	12	0 – 18	10.5	0 – 26
3	13.6	0 – 21	11.6	0 – 86
4	15	0 – 35	12.3	13 – 141
5	18	10 – 40	14.5	19 – 208*
Male Ranges by Age		Range (pg/mL)		
15 days – 1 year:		0 – 25		
1 – 11 years:		0 – 13		
11 – 13 years:		0 – 26		
13 – 15 years:		0 – 28		
15 – 19 years:		0 – 38		
Female Ranges by Age		Range (pg/mL)		
15 days – 1 year:		0 – 25		
1 – 9 years:		0 – 10		
9 – 11 years:		0 – 48		
11 – 12 years:		0 – 94		
12 – 14 years:		11 – 172		
14 – 19 years:		10 – 255		
*Menstruating Females (pg/mL)				
Follicular Phase:		21 - 251		
Midcycle Phase:		38 - 649		

Luteal Phase:	21 - 312
Postmenopausal, not on HRT	<10 - 28
Postmenopausal on HRT	<10 - 144

Critical Values: N/A

Limitations: In menopausal females, order estrogens rather than estradiol, Estradiol increases with hepatic cirrhosis. Estradiol level can be normal in women who have hypogonadism.

Medications listed here cause interference with this assay:

- Norethindrone at a concentration of 32 ng/mL: -23%
- Ethynylestradiol at a concentration of 0.8 ng/mL: -11%

Methodology: Chemiluminescent Microparticle Immunoassay

Contraindications: Should not be used in pregnant females or to evaluate fetal well - being because it does not measure estriol. Estriol comprises >90 % of maternal estrogens. However, Guillaume et al report the use of estradiol in the effective diagnosis of ectopic pregnancy (low values are seen).

References: Architect Estradiol Reagent Package Insert. Revised June 2016. Abbott Laboratories, Abbott Park IL 60064 USA

Konforte, D, Shea J, et al (2013) Complete Biological Pattern of Fertility Hormones in Children and Adolescents: A Study of Healthy Children from the CALIPER Cohort and Establishment of Pediatric Reference Intervals. *Clinical Chemistry* 59:8, pp 1215-1227

Young RH and Scully RE (1994) Sex Cordstromal, Steroid Cell, and Other Ovarian Tumors With Endocrine, Paraneoplastic, and Paraneoplastic Manifestations, *Blaustein's Pathology of the Female Genital tract*, 4th ed, Kurman RJ, ed, New York, NY: Springer-Verlag, 783-847

Chenette PE, Sauer MV, and Paulson RJ (1994) Very High Serum Estradiol Levels Are Not Detrimental to Clinical Outcome of In Vitro Fertilization, *Fertil Steril*, 54 (5):858-63

Guillaume J, Benjamin F, Sicuranza BJ, et al (1990) Serum Estradiol as an Aid in the Diagnosis of Ectopic Pregnancy, *Obstet Gynecol*, 76(6):1126-9

Updates:

3/8/2010: Method change, previously listed as RIA. Units changed from ng/dL to pg/mL changing all reference values by a factor of 10.

8/3/2016: Tube type update.

4/24/2018: Testing moved from Esoterix to internal test at Children's MN. Method and ref range update.

5/9/2018: Updated reference range: Tanner Stages to CALIPER Study and added menstruating females ranges. Updated limitations to include medication interferences.