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**Lab Dept:** Chemistry

**Test Name:** ESTRADIOL

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***General Information***

**Lab Order Codes:** DIOL

**Synonyms:** 17-Beta estradiol

**CPT Codes:** 82670 - Estradiol

**Test Includes:** Estradiol level reported in pg/mL.

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***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 - Sendouts

**Referred to:** Esoterix, Inc (ESL Test: 500152)

**Phone Numbers:** MIN Lab: 612-813-6280

STP Lab: 651-220-6550

**Test Availability:** Daily, 24 hours

**Turnaround Time:** 5 - 9 days, test setup Monday - Saturday

**Special Instructions:** N/A

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***Specimen***

**Specimen Type:** Blood

**Container:** SST (Marble or gold, or red)

**Draw Volume:** 6 mL (Minimum: 3.6 mL) blood

**Processed Volume:** 2 mL (Minimum: 1.2 mL) serum

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

**Collection:** Routine venipuncture

**Special Processing:** Lab Staff: Centrifuge specimen within 1 hour of collection. Remove serum aliquot into a screw-capped plastic vial. Store and ship at frozen temperatures. Forward promptly.

**Patient Preparation:** None

**Sample Rejection:** Mislabeled or unlabeled specimens

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***Interpretive***

**Reference Range:**

**Newborn:**

Levels are markedly elevated at birth and fall rapidly during the first week to prepubertal values of <15 pg/mL.				
<b>1 – 6 Months:</b>				
Males: Levels increase to 10 – 32 pg/mL between 30 and 60 days, then decline to prepubertal levels of <15 mg/mL by 6 months.				
Females: Levels increase to 5 – 50 pg/mL between 30 and 60 days, then decline to prepubertal levels of <15 pg/mL during the first year.				
<b>Prepubertal Children (1 – 10 years):</b>				
Both Male and Female: <15 pg/mL				
<b>Puberty:</b>	<b>Male</b>		<b>Female</b>	
Tanner Stage	Age (years)	Estradiol pg/mL	Age (years)	Estradiol pg/mL
1	<9.8	5 – 11	<9.2	5 – 20
2	9.8 – 14.5	5 – 16	9.2 – 13.7	10 – 24
3	10.7 – 15.4	5 – 25	10.0 – 14.4	7 – 60
4	11.8 – 16.2	10 – 36	10.7 – 15.6	21 – 85
5	12.8 – 17.3	10 – 36	11.8 – 18.6	34 – 170
<b>Adults:</b>				
<b>Males:</b>		8 – 35 pg/mL		
<b>Female:</b>		Follicular: 3 – 10 pg/mL		
		Luteal: 7 – 30 pg/mL		
		Postmenopausal: <15 pg/mL		

**Critical Values:** N/A

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

**Methodology:**

HPLC, Tandem Mass Spectrometry

**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:**

[Esoterix, Inc. Web Page](#) July 2012

Esoterix, Inc. "Expected Value & S.I. Unit Conversion Table" Fifth Edition

Young RH and Scully RE (1994) Sex Cordstromal, Steroid Cell, and Other Ovarian Tumors With Endocrine, Parendocrine, and Paraneoplastic Manifestations, Blaustein's Pathology of the Female Genital tract, 4<sup>th</sup> 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.