

# SALIVA TEST SPECIFICATIONS

## Estrone

### Clinical Information

Estrone is one of three main circulating estrogens in humans. Like estradiol, estrone is secreted by the ovaries, but it is also predominantly produced in peripheral tissues by the action of aromatase on its precursor androstenedione. Its estrogenic activity is intermediate to that of estriol, the weakest estrogen, and estradiol, the strongest. Estrone is converted to the more potent estradiol in tissues by the action of 17 $\beta$ -hydroxysteroid dehydrogenase, and through this conversion it represents the main source of circulating estradiol in postmenopausal women and in men. Estrone is the predominant circulating estrogen in postmenopausal women, compared to estradiol which predominates in premenopausal women. This is because ovarian estradiol production declines significantly post-menopause while estrone production from androstenedione changes minimally compared to premenopause. The aromatization of androstenedione to estrone increases with increased body weight, since aromatase is prevalent in fat tissue. This increased availability of estrone contributes to the rise in circulating estradiol with increasing body mass index in obese postmenopausal women.

The reference range for saliva estrone is 3.2–7.9 pg/mL in premenopausal women during the luteal phase; 0.9–3.1 pg/mL in postmenopausal women; and 1.3–3.6 pg/mL in men.

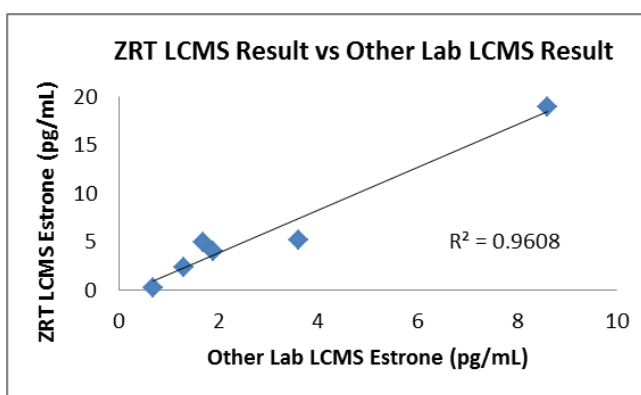
### References:

Simpson ER. Sources of estrogen and their importance. *J Steroid Biochem Mol Biol.* 2003;86:225-30.  
Bagot CN, Marsh MS, Whitehead M, et al. The effect of estrone on thrombin generation may explain the different thrombotic risk between oral and transdermal hormone replacement therapy. *J Thromb Haemost.* 2010;8:1736-44.  
Jones ME, Schoemaker M, Rae M, et al. Changes in estradiol and testosterone levels in postmenopausal women after changes in body mass index. *J Clin Endocrinol Metab.* 2013;98:2967-74.

### Assay Method: LC-MS/MS

#### Accuracy

ZRT has established the first salivary proficiency testing program, which includes most of the major saliva testing laboratories in the US. Twice yearly, results from prepared samples are compared to those from other laboratories that test estrone; one of these laboratories tests estrone using LC-MS/MS. As shown in the graph, ZRT results compare very favorably to the other saliva testing laboratory using LC-MS/MS for the estrone assay.



#### Precision/Reproducibility

Inter-assay precision was determined by choosing pooled saliva samples spanning the reference range for estrone, and analyzing them multiple times over a 30-60 day period. Results are shown below:

Mean Estrone Concentration (pg/mL)	Coefficient of Variation (C.V. %)
1.8	5.9
6.5	8.5
30.4	7.4

#### Linearity

The ZRT saliva estrone assay gives excellent linearity over the reportable range of 0.2–510 pg/mL. Samples giving values >510 pg/mL are diluted and re-assayed for accurate reporting. Values below 0.2 pg/mL are not sufficiently precise and are reported as <0.2 pg/mL.

#### Sensitivity

The functional sensitivity for the estrone assay is 0.2 pg/mL.

#### Stability

Saliva samples are stable at room temperature for 30 days for estrone determination, but customers are advised to mail samples as soon as possible after collection. Samples are rejected for analysis if they were not received within 30 days of collection and were not refrigerated or frozen.

#### Accreditation

ZRT Laboratory is a CLIA certified testing laboratory.