**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 17β-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:**


**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.

![ZRT LCMS Result vs Other Lab LCMS Result](image)

\[ R^2 = 0.9608 \]

**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:

<table>
<thead>
<tr>
<th>Mean Estrone Concentration (pg/mL)</th>
<th>Coefficient of Variation (C.V. %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8</td>
<td>5.9</td>
</tr>
<tr>
<td>6.5</td>
<td>8.5</td>
</tr>
<tr>
<td>30.4</td>
<td>7.4</td>
</tr>
</tbody>
</table>

**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.