### Hormone Reference Ranges

**Expanded Postmenopause Hormone Panel**

<table>
<thead>
<tr>
<th>Hormone</th>
<th>Result</th>
<th>Notes</th>
<th>Reference Ranges</th>
</tr>
</thead>
<tbody>
<tr>
<td>DHEA - Dehydroepiandrosterone Free [DHEA + DHEA-S]</td>
<td>7</td>
<td>Normal</td>
<td>Adults (M/F): 3-10 ng/ml</td>
</tr>
<tr>
<td>TTF - Free Testosterone</td>
<td>14</td>
<td>Normal</td>
<td>Borderline: 6-9 pg/ml Normal: 10-38 pg/ml</td>
</tr>
<tr>
<td>E1 - Estrone</td>
<td>50</td>
<td>Normal</td>
<td>Normal for Age 50-59: 26-64 pg/ml</td>
</tr>
<tr>
<td>E2 - Estradiol</td>
<td>3</td>
<td></td>
<td>Postmenopause-No HRT: 1-4 pg/ml HRT Target Range: 2-10 pg/ml Follicular: 2-10 pg/ml Luteal: 3-16 pg/ml</td>
</tr>
<tr>
<td>E3 - Estriol</td>
<td>8</td>
<td></td>
<td>Postmenopause-No HRT: 7-18 pg/ml HRT Target Range: 14-38 pg/ml Cycling Female: 12-25 pg/ml</td>
</tr>
<tr>
<td>P1 - Progesterone</td>
<td>60</td>
<td></td>
<td>Postmenopause-No HRT: 5-95 pg/ml HRT Target Range: 100-300 pg/ml Follicular: 20-100 pg/ml Luteal: 65-500 pg/ml</td>
</tr>
<tr>
<td>FSH - Follicle Stimulating Hormone</td>
<td>180</td>
<td></td>
<td>Premenopause: &lt;125 uIU/mL Postmenopause: 90-500 uIU/mL</td>
</tr>
<tr>
<td>LH - Luteinizing Hormone</td>
<td>60</td>
<td></td>
<td>Premenopause: 8-30 uIU/mL HRT: 8-30 uIU/mL Postmenopause-No HRT: 25-200 uIU/mL</td>
</tr>
</tbody>
</table>

**Please Note:** Beginning August 28, 2010, Diagnos-Techs has updated reference ranges for testosterone and estradiol using more advanced salivary tests. New reference ranges have been established according to the latest CLSI guidelines. More interpretation and the action plan on following pages.

**Diagnosis Code:** Not Provided To The Lab.
1. Enhanced Proliferation. 5. Mild Androgen Dominance.
3. Hormone Overload. 7. Female Hormone Deficit.
4. Pro-Proliferative. 8. Hypogonadism with Atrophy.

**Your hormone values are in the Optimal Zone.**

**Explanation:**

**OPTIMAL ZONE**

This zone indicates balanced estrogen, progesterone and testosterone levels. Unless otherwise indicated on this report, patients in this zone are encouraged to maintain the current hormonal regime when applicable, and refrain from hormone supplementation. If patient is symptomatic further investigation is merited and should include an adrenal axis evaluation (e.g. Adrenal Stress Index profile).

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**Your hormone values are in Zone 3.**

**Explanation:**

**ZONE 3: POTENTIALLY PROLIFERATIVE**

Zone 3 represents normal estrogenic activity not counteracted by sufficient amounts of progesterone resulting in a relatively proliferative environment. This state favors:

I. Mild target tissue proliferation: endometrial thickening, uterine bleeding, fibroids, infertility etc.

II. Somatic: Mild increase in body fat deposition, weight gain and water retention.

III. Nervous system (CNS) dysfunction which includes cognitive changes, headaches, anxiety, panic attacks, insomnia and depression with mood swings.

**What Next?**

Consider the restoration of Progesterone (Progesterone + Pregnenolone)

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Need a more complete explanation of the Indexes?
See respective sections on the following page.

Please Note: All examples of patient treatment or therapy are for illustrative and/or educational purpose. Use this report in context of the clinical picture and patient history before initiating hormone or other therapies or recommendations.

For post menopause women not using HRT expect them to fall within post menopause-No HRT range.

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COURTESY INTERPRETATION/Technical support available upon request, to Physicians Only.
BREAST PROLIFERATION INDEX (BPI)

Explanation:
Several reproductive hormones exert trophic effects on the breast tissue i.e. cellular division and differentiation. Unchecked trophic stimulation can lead to undesired proliferation of the tissue. Over time, breast cysts, hyperplasia and lesions are promoted. Estradiol (E2), Estrone (E1) and Estriol (E3) in descending order of potency exert proliferative influences on breast tissue. Progesterone also exerts a proliferative influence with increasing concentration. On the other hand, testosterone, in the normal to mildly hyperphysiologic range, exerts a significant estrogen antagonizing and anti-proliferative effect which modulates and reduces estrogenic proliferative effects.

Note:
Chronic exposure to high concentration of proliferative hormones is usually required to promote the initial proliferative stages of estrogen-sensitive lesions. However, the maintenance of the lesions may not require high concentrations of proliferative hormones. This phenomenon explains the difficulties and prolonged time required to reverse tissue proliferation that has already taken place.

What does the BPI Index mean?
The BPI is a graphical comparison of the proliferative and anti-proliferative hormone activity of the patient. The combined proliferative activity of the three estrogens plus the concentration-dependent contribution of progesterone is represented on the horizontal graph axis (X-axis). The testosterone anti-proliferative activity is represented on the vertical axis (Y-axis).

The BPI graphic grid has 8 distinct numbered zones with an explanatory key below the graph. The patient values of E1, E2, E3, progesterone and testosterone are used to calculate indices and plotted as a solid square that appears one of the numbered zones.

UTERINE PROLIFERATION INDEX (UPI)

Explanation:
It is established that estrogens including Estradiol (E2), Estrone (E1) and Estriol (E3) in descending order of potency can induce proliferative changes in the endometrium at any age. Endometrial hyperplasia with rapid blood vessel formation is one of the major outcomes of estrogen hormone replacement therapy in postmenopausal women. On its own, the estrogen proliferative effect is additive and cumulative over time and is manifested clinically as breakthrough bleeding. Estrogens help organize and capacitate the endometrial cells to respond to progesterone-mediated functionalization with view of constructing an embryo-receptive lining.

Progesterone helps transform the rapidly growing cells into mature ones. It prevents the endometrium from rapidly outgrowing its developing blood supply. Progesterone inhibits uncontrolled endometrial cell growth that otherwise would lead to proliferative lesions.

What does the UPI Index mean?
The UPI is a graphical comparison of the correlation between the proliferative hormone activity (Measured Estrogenic Activity-EA) and the Anti-proliferative activity (Measured Progesterone levels). The EA takes into account the genomic and non-genomic proliferative activity of the three main estrogens. The EA is represented on the horizontal axis (X-axis). The progesterone anti-proliferative activity is represented on the vertical axis (Y-axis).

The UPI graphic grid has 8 distinct numbered zones with an explanatory key below the graph. The patient values of E1, E2, E3 and progesterone are used to calculate indices and appear as a solid square in one of the numbered zones.

Why Choose Grid Analysis over Hormone Ratios?
Proper hormone balance is not achieved at all concentrations. It is only achieved within matched physiologic concentration ranges of the respective hormones. The use of arithmetic ratios of sex hormone concentrations for the purpose of reference range analysis, as used by other laboratories, is usually deceiving. The absolute concentrations of the hormones are extremely important and are not included in arithmetic ratio analysis.

For more accuracy in interpretation, a two dimensional Zoned Grid Method is used in this report. The following example will illustrate the inadequacy of the arithmetic ratio method. At high concentrations of the respective hormones (Zone 3 in the BPI, and Zone 1 in the UPI), you may have a perfect arithmetic ratio between the estrogens and testosterone which other labs consider normal. However, the following adaptive processes may come into play:

I. At high hormone concentrations, receptor involution takes place blocking the binding of hormone to receptors. This may lead to unpredictable or paradoxical effects.

II. At high hormone concentrations there is receptor confusion, i.e. one hormone cross-reacts non-specifically with the receptors of another leading to unpredictable effects.

III. At high concentrations certain hormones inhibit the synthesis of other antagonistic hormones, or promote the production of synergistic ones.