**MONITORING (B)HRT WITH LAB TESTING**

Tutorials available at www.dutchtest.com/videos/hormone-tutorials

<table>
<thead>
<tr>
<th>Oral Progesterone</th>
<th>Patch, Pellet, Injection</th>
<th>Transdermal Estrogen</th>
<th>Transdermal Testosterone</th>
<th>Transdermal Progesterone</th>
<th>Vaginal or Anal Mucosa</th>
<th>Oral Estrogen</th>
<th>Sublingual</th>
</tr>
</thead>
<tbody>
<tr>
<td>✔ DUTCH</td>
<td>✔ DUTCH</td>
<td>✔ DUTCH</td>
<td>✔ DUTCH</td>
<td>❌ DUTCH</td>
<td>✔ DUTC (E/T)</td>
<td>❌ DUTCH</td>
<td>❌ DUTCH</td>
</tr>
</tbody>
</table>

- The DUTCH test® provides useful feedback when using oral progesterone to aid sleep disturbance related to menopause. 5a (more active) and 5b (less active) metabolites are measured to individualize doses of oral progesterone. Much of the clinical impact is from the effects of the 5a-metabolites.

- Values increase intuitively with dosing. For estrogen patches, see Transdermal Estrogen comments. Pellets and injections also increase levels intuitively, but the increase may exceed what is seen in serum testing. DUTCH allows for monitoring both the proper dosing of hormones as well as metabolic patterns.

- Levels generally parallel measurable clinical outcomes (increased lean body mass, decreased LH values in men). Epi-testosterone values can also be used to assess gonadal suppression due to TRT (levels decrease as TRT increases and are <10 ng/mg with complete suppression).

- Creams and gels cannot be effectively monitored with any lab testing.

- Special method removes potential contamination and monitoring is helpful with most hormones. Very low doses may impact local tissue without increasing lab values.

- Progesterone is measured indirectly in urine by measuring pregnanediol. This metabolite is underrepresented when taken vaginally.

- Cannot be used to effectively monitor dosing due to first-pass metabolism. Most of the hormone in urine has not been in circulation as “free” hormone.

- Lab testing is not effective. DUTCH is confounded by the hormone that is swallowed.

## Results go up-and-down quickly. If taken at bedtime, levels return to baseline within a few hours. Results can also be inaccurate due to progesterone metabolites cross-reacting with immunoassay tests.

- Serum testing is well suited for use with these types of therapies. Results increase with increased dosing in a fairly linear fashion.

- Serum levels likely represent systemic uptake of hormone, interpret with care as you may not know if your value represents a peak or a trough.

- Serum testing offers the best feedback on monitoring the actual dose of oral estradiol.

- Serum testing is not effective. Results rise and fall too rapidly for useful testing. In many cases, results are back to baseline within a few hours.

### What about salivary testing?

The literature to date reveals that salivary testing is clinically inaccurate for monitoring many situations, including transdermal hormone creams. Hormone injections, estrogen patches, and oral tablets along with vaginal hormones may be properly represented by salivary testing, although data is limited. For each of the situations in which salivary testing may parallel the clinical impact, DUTCH (for injections, patches, vaginal estrogen, and testosterone) or serum testing (for injections, patches, oral estradiol, and vaginal hormones) are better options. While salivary testing is the Gold Standard for free cortisol measurement, avoiding its use for monitoring HRT is advised.

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