

DUTCH TESTING & (B)HRT GUIDE - MEN

Disclaimer: This form is a reference for providers and not to be considered medical advice or an endorsement of any particular HRT therapy. Any HRT may involve risks, and it is the sole responsibility of the provider to consider these risks and make treatment decisions.

Pellet	Injection	Transdermal	DHEA	HCG or Clomiphene
WHY				
Testosterone pellets offer consistent hormone dosing over time. Most pellet doses tend to suppress endogenous testosterone production. They can be given with aromatase inhibitors if estrogen production is a concern.	The most frequently used testosterone injections are testosterone cypionate (8 day half-life) and testosterone enanthate (4-5 day half-life). Injections provide robust testosterone levels for 1-2 weeks typically. Bi-weekly dosing (lower dosing) may offer improved steady state and less highs and lows.	Testosterone creams and gels are the most popular TRT formulation but can be challenging to dose and monitor effectively. Doses between 50 and 150mg are commonly used in studies in order to see improvements in muscle mass and other clinical parameters. Application is convenient, but patients must also be careful to avoid transference (to partners, children, or pets).	Even though testosterone is downstream from DHEA, very little testosterone is made from circulating DHEA. The testes make testosterone directly (from cholesterol), so do not give DHEA expecting significant increases in testosterone. Oral or sublingual DHEA is often used. The latter may absorb directly in the mouth and bypass gut/liver metabolism, which may result in less estrogen production.	Human chorionic gonadotropin (hCG) acts as an LH analog and stimulates the Leydig cells to produce testosterone. Clomiphene citrate, a selective estrogen receptor modulator (SERM) can also be used for secondary hypogonadism. By blocking negative feedback of estrogen receptors, it increases gonadotropin levels, indirectly increasing testosterone production. These two options are not advised for primary hypogonadism.
Common Dosing Strategies				
<p>Low 400 mg</p> <p>High 1600 - 2000 mg</p> <p>Most Common 800 - 1200 mg</p> <p><i>Inserted every 4-6 months</i></p>	<p>Low 25 - 100 mg</p> <p>High >300 mg</p> <p>Most Common 100 - 250 mg</p> <p><i>Self-administered every one to two weeks</i></p>	<p>Low 25 - 75 mg</p> <p>High 150 - 250 mg</p> <p>Most Common 50 - 100 mg</p> <p><i>Typically applied daily</i></p>	<p>Low 5 - 10 mg</p> <p>High >100 mg</p> <p>Most Common 10 - 25 mg</p> <p><i>Typically taken daily</i></p>	<p>HCG 100 - 250 ug (2000 - 5000 IU) <i>Taken 2 - 3 times/week</i></p> <p>Clomiphene 25 mg <i>Taken every other day</i></p>
How to Monitor with DUTCH				
<p>Urine testosterone levels are often supraphysiological in the days following an injection and in the first three months of pellet therapy. With 1200 mg testosterone pellets, results are expected to be 90-220ng/mg over this period (reference range 25-115ng/mg).</p> <p>Monitor testosterone along with its metabolites to assess 5a-DHT production and evaluate potential need for blocking 5a-reductase. Patients on TRT should also be evaluated for aromatization of testosterone to estradiol by monitoring estradiol and its metabolites.</p>	<p>Doses proven to increase muscle mass (25-100mg) in most recipients typically push DUTCH testosterone levels to levels matching the reference range for young, healthy men (50-115ng/mg). Monitoring 5a-DHT and its metabolite will assist in evaluating if 5a-blockers may be appropriate. Epi-testosterone levels will often be only partially suppressed (not below 10ng/mg), which implies that endogenous production (and likely pituitary LH secretion) is only partially suppressed. Monitor estrogen conversion and metabolism as well.</p>	<p>Overall DHEA levels can be monitored with the total of DHEA metabolites (DHEA-S, etiocholanolone, androsterone). Also monitor the downstream conversion to estrogens along with estrogen metabolites. Be aware that DHEA can form testosterone metabolites without necessarily making testosterone itself.</p>	<p>Providers may want to target young, healthy testosterone levels (50-115ng/mg) with these therapies. 50-150% increases are common in hypogonadal men. Metabolites of testosterone (including DHT production) should all be monitored along with estrogen production and metabolism. Estradiol production will often exceed physiological levels with hCG use.</p>	
<div style="border: 1px solid green; padding: 5px;"> <p>In men who are not on TRT, epi-testosterone is expected to be found in similar concentrations as testosterone. When gonadal production of hormones is suppressed by TRT, epi-testosterone may be a good indicator of this suppression. Typically levels below 10ng/mg indicate suppression (and especially if <5ng/mg). While correlating data has not been generated, these levels may parallel serum LH levels. Both LH and epi-testosterone are suppressed by most doses of injections and pellets.</p> </div>				

DUTCH TESTING & (B)HRT GUIDE - WOMEN

Disclaimer: This form is a reference for providers and not to be considered medical advice or an endorsement of any particular HRT therapy. Any HRT may involve risks, and it is the sole responsibility of the provider to consider these risks and make treatment decisions.

Oral Progesterone	Estradiol Patch	Estradiol Cream/Gel	Testosterone or Estradiol Pellet	Vaginal Estrogen or Testosterone	Testosterone Cream/Gel	DHEA
Why						
Effective at balancing ERT, but clinical effects are due largely to metabolites formed in the gut. A good option when postmenopausal women struggle with sleep. A different ROA may be better for premenopausal women. 100-200mg has been shown to balance concurrent ERT.	Patches offer consistent hormone dosing over time and are very effective at managing hot flashes. Even low doses typically increase bone mineral density (BMD).	Proven to increase serum and urine levels as well as improve hot flashes and BMD. Transdermal E2 is attractive because it is easy to use and bypasses first pass metabolism. Estriol often given in doses 1 - 4 times higher than estradiol.	Pellets offer consistent hormone dosing over time for testosterone and estradiol. Research is limited on effects on hot flashes and BMD. Because serum/urine E2 levels match or exceed those seen in patches, E2 pellets are likely to help with hot flashes and BMD.	Low doses increase local tissue levels while higher doses also increase systemic levels. Placing in the top 1/3 of the vagina significantly increases uterine levels. Estriol often given in doses 1 - 4 times higher than estradiol.	Transdermal testosterone can be used to correct low T and improve sex drive and muscle mass.	Sublingual or oral DHEA will increase systemic levels and also contribute to downstream androgens (testosterone) and estrogens.
<i>ERT, especially with an intact uterus, should be balanced with adequate progesterone (vaginal or oral preferred).</i>						
Common Dosing Strategies						
<p>Low 25 - 50 mg</p> <p>High >200 mg</p> <p>Most Common 100 - 200 mg</p> <p><i>Consider taking continuously or as an on/off cycle</i></p>	<p>Low 0.012 - 0.025 mg</p> <p>High 0.1 mg</p> <p>Most Common 0.05 mg</p> <p><i>Consider taking continuously or as an on/off cycle and changed 1 - 2 times per week</i></p>	<p>Low 0.1 - 0.25 mg Estradiol 0.1 - 1.0 mg Estriol</p> <p>High 1.0 - 2.5 mg Estradiol 2.0 - 5.0 mg Estriol</p> <p>Most Common 0.25 - 0.5 mg Estradiol 0.25 - 2.5 mg Estriol</p> <p><i>Consider taking daily continuously or as an on/off cycle</i></p>	<p>Low <5 mg Estradiol 20 - 50 mg Testosterone</p> <p>High >12 mg Estradiol >125 mg Testosterone</p> <p>Most Common 5 mg Estradiol 100 mg Testosterone</p> <p><i>Inserted every 3 - 4 months</i></p>	<p>Low 0.01 mg Estradiol 0.25 mg Testosterone</p> <p>High 0.5 mg Estradiol 2 mg Testosterone</p> <p>Most Common 0.1 mg Estradiol 0.25 - 1.0 mg Estriol 0.25 - 1.0 mg Testosterone</p> <p><i>Taken daily, possibly with cycling</i></p>	<p>Low 0.5 - 2.0 mg</p> <p>High 10 - 20 mg</p> <p>Most Common 1 - 5 mg</p> <p><i>Taken daily, at waking or bedtime</i></p>	<p>Low 1 - 5 mg</p> <p>High 25 - 50 mg</p> <p>Most Common 5 - 10 mg</p> <p><i>Usually taken daily</i></p>
How to Monitor with DUTCH						
DUTCH results only show which metabolites are preferred. Evaluate which pathway is dominant (alpha or beta). If patients push down the alpha pathway, a lower dose may be used. Those who prefer beta metabolism and aren't sleeping well might benefit from a higher dose.	<p>Monitoring Estrogen Replacement Therapy (ERT)</p> <p>Target values between the top of the postmenopausal range (0.7ng/mg for estradiol) and within the first third of the premenopausal range (about 2.5ng/mg).</p> <p>The specific target for a patient depends on the patient's history and symptoms as well as the patient and provider's comfort level with the risks for too much (breast cancer, etc.) and too little (osteoporosis, etc.) estrogen.</p> <p>It is recommended to closely monitor phase I metabolites to ensure that too many 4-OH metabolites are not formed. Methylation should also be evaluated and supported if inadequate. DUTCH OATs may also be helpful to ensure that a nutrient deficiency is not present. ERT may induce vitamin B6 deficiency. Proper metabolism requires B6, B12, and glutathione.</p> <p>For testosterone pellets, premenopausal levels should be targeted and patient symptoms monitored. Evaluate 5a-reductase activity before dosing with testosterone to ensure there isn't excessive 5a metabolism.</p>			Levels above the postmenopausal range imply systemic uptake. For localized (vaginal) effects only, results should not exceed the postmenopausal range. Expect higher E2 levels compared to E1 and downstream metabolites.	It is optimal if levels of T (as well as metabolites) are in range. Less is needed if metabolites are 5a favored. Also monitor patient symptoms for excessive T.	Monitor conversion to testosterone, E2 and metabolites of both. DHEA and testosterone metabolites may be artificially elevated if the patient doesn't skip the dose of DHEA the day of and day before the test (as described in the test instructions).
<i>Transdermal progesterone, oral estrogen and sublingual hormones, are not well monitored by DUTCH and are not represented on this form along with a few other lesser used HRT options.</i>						