HORMONE LEVELS

Estradiol

LH

Progesterone

MENSTRUAL CYCLE

dutchtest®
CYCLE MAPPING

For some women, testing reproductive hormones (progesterone, estrogen, etc.) on a single day is sufficient. In other scenarios, the clinical picture cannot be properly captured without "mapping" out the hormonal pattern throughout their menstrual cycle.

The expected pattern of hormones shows relatively low estrogen levels early in the cycle, a surge around ovulation and modest levels in the latter third of the cycle (the luteal phase). Progesterone levels, on the other hand, stay relatively low until after ovulation. After ovulation, levels ideally increase (>10-fold) and then drop back down at the end of the cycle. A disruption in this cycle can lead to infertility or hormonal imbalance.

WHEN IS DUTCH CYCLE MAPPING™ RECOMMENDED?

· Women struggling with infertility
· Women with cycling hormones and no menses
  · Partial hysterectomy (ovaries intact but no uterus)
  · Ablations
  · Mirena IUD (no actual menstrual bleeding due to IUD but still has hormonal symptoms)
· Women with irregular cycles
  · PCOS
  · If the luteal phase shifts from month-to-month
  · Not sure when to test due to long or short cycles
· Women whose hormonal symptoms tend to fluctuate throughout the cycle
  · PMS, mid-cycle spotting, migraines, etc.

WHEN IS DUTCH CYCLE MAPPING™ NOT NEEDED? (DUTCH COMPLETE™ IS SUFFICIENT)

· Postmenopausal women
· Women on birth control
· Women with cycles that follow the expected pattern

DUTCH CYCLE MAPPING™ - PROVIDER INFORMATION SHEET

EASY SAMPLE COLLECTIONS MAKE FOR BETTER TESTING

Salivary mapping of hormones limits the number of collections, which may result in missing progesterone and especially estrogen peaks if not timed correctly. For women with irregular cycles, this is particularly problematic. DUTCH Cycle Mapping™ uses more sample collections (convenient, first-morning urine collections) and performs testing on targeted samples based on the actual length of the cycle. This allows for better characterization of both the ovulatory and luteal peaks.

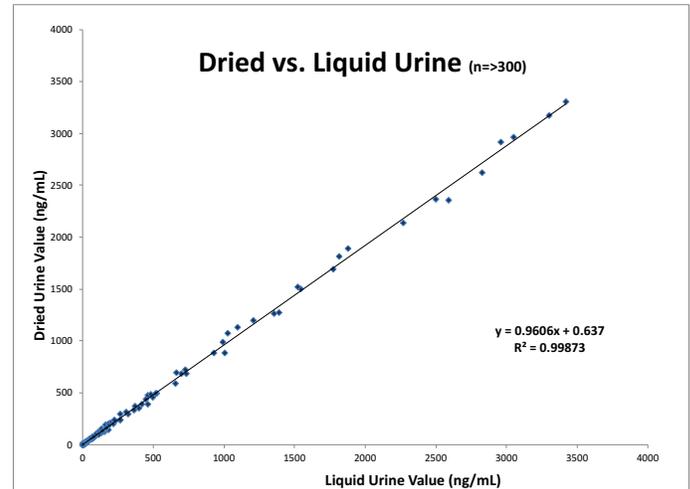## BETTER TESTING MAKES FOR BETTER TREATMENT

Treating women appropriately and effectively with irregular cycles, fertility problems, or who have had an ablation can be challenging to practitioners because it is difficult to fully ascertain what their hormones are doing and when. By using the DUTCH Cycle Mapping™ test, a complete picture of the patient's cycle in graph format will allow for a more accurate and comprehensive treatment program specific to the patient's situation. The clinician can understand if and when a patient is ovulating. They can also determine why their patients are having mid-cycle spotting or hormonal migraines. This will help them get a clear understanding of how their patient's ovaries are functioning or look further into fertility issues. These answers will help with the clinician's goal of individualized medicine.

HOW WELL DO ESTROGEN AND PROGESTERONE VALUES CORRELATE WITH SERUM MEASUREMENTS?

Hormone patterns throughout the menstrual cycle parallel simultaneously collected serum samples very well. When compared to salivary measurements, *DUTCH* measurements showed improved correlation to serum for both progesterone and especially for estradiol.

DO DRIED SAMPLES COMPROMISE THE ANALYSIS?

Dried samples are accurate for hormone testing, and values correlate to liquid samples (see graph, below). Samples are more stable once they are dried and also much easier to store and ship than liquid samples.

Dried vs. Liquid Urine (n=>300)

X-axis: Liquid Urine Value (ng/mL), Y-axis: Dried Urine Value (ng/mL)

$y = 0.9606x + 0.637$
$R^2 = 0.99873$

METHODS USED FOR TESTING

Estrogen and progesterone metabolites for this profile are all tested (9x) by GC-MS/MS. This is the most accurate method for testing urinary reproductive hormones and their metabolites. Other options include immunoassays, LC-MS/MS or GC-MS/MS.

WHAT'S INCLUDED IN THIS KIT?

· 25 Dried Urine Collection Devices
· Cycle Mapping™ Requisition Form
· Resealable Plastic Bag
· Return Envelope / Payment Card (If needed)
· Test Instructions

Accession # 287453	Name:	**Female Sample Report**	D.O.B.	**1/1/1976**
	Provider:	**Precision Analytical**	Collection Dates	**1/1-1/20-2018**

DUTCH - Cycle Mapping
Monthly Pattern of Urinary Estrogen and Progesterone Metabolites
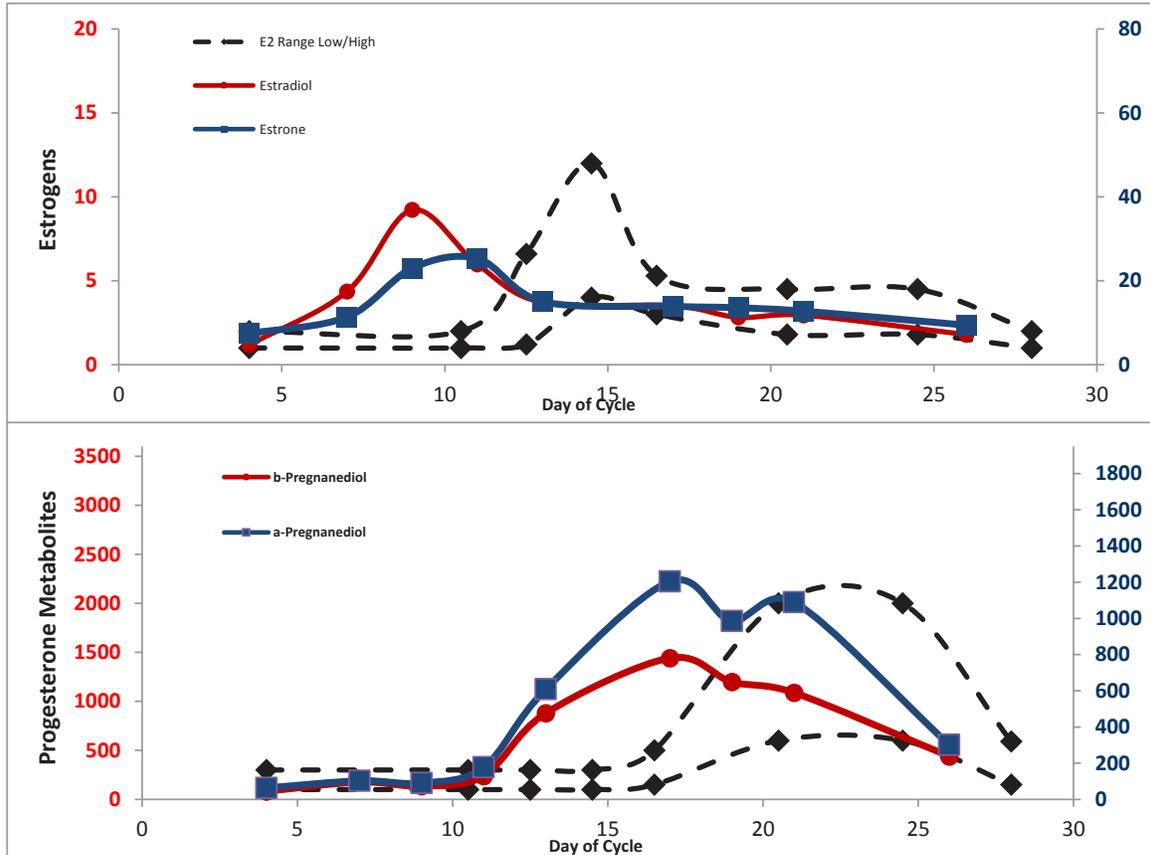
All values given in ng/mg creatinine

Measurement	1	2	3	4	5	6	7	8	9
Day of Cycle	4	7	9	11	13	17	19	21	26
Estradiol (E2)	1.2	4.4	9.2	6.0	3.7	3.5	2.8	2.9	1.8
Estrone (E1)	7.4	11.4	23.0	25.3	15.1	13.9	13.6	12.8	9.4
a-Pregnanediol	63	103	90	178	608	1204	985	1090	301
b-Pregnanediol	83	177	136	239	879	1442	1197	1088	439
b-Pg / E2 Ratio	71	41	15	40	237	409	425	369	245

Normal Ranges	Follicular	Ovulatory	Luteal	Postmenopausal
Estradiol	1-2ng/mg	4-12ng/mg	1.8-4.5ng/mg	0.3-0.9ng/mg
Estrone	4-12ng/mg	22-68ng/mg	12-26ng/mg	3.0-9.0ng/mg
a-Pregnanediol	25-100ng/mg	25-100ng/mg	120-740ng/mg	15-50ng/mg
b-Pregnanediol	100-300ng/mg	100-300ng/mg	450-2300ng/mg	60-200ng/mg
b-Pg / E2 Ratio	50-300	<100	100-500	50-300

Measurements are made from individual samples and/or two-day sample averages to give an optimized overview of the hormone patterns

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