

10 ESSENTIAL HORMONAL LAB TESTS FOR WOMEN DECIPHERED

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Are you wondering what's going on in your body and trying to decide if lab testing might give you some answers?

It's important to know what tests to ask your doctor for and to be able to interpret them so that you can best advocate for your health.

First, let's talk about how to identify the typical symptoms of hormonal imbalance:

They include:

- ✓ Irregular periods
- ✓ Spotting between your periods
- ✓ Changes in the quality of your period – pain, clotting, heaviness, lightness
- ✓ Changes in your mood – particularly if they are related to your menstrual cycle time
- ✓ Hot flashes
- ✓ Feeling cold, or having cold extremities
- ✓ Weight gain
- ✓ Insomnia
- ✓ Infertility
- ✓ Palpitations
- ✓ Acne
- ✓ Hair growth on your face, abdomen or back
- ✓ Hair loss
- ✓ Fatigue
- ✓ Cravings for sugar

Wow, that's a whole lot, right?

As women, we all experience some of these symptoms at one time or another during our lives.

There are a variety of conditions that can be associated with the above signs and symptoms including PCOS, premature ovarian insufficiency, autoimmune disease, thyroid disorders including Hashimoto's, endometriosis, menopause and perimenopause, adrenal fatigue and much, much more.

So, let's cut to the chase. I'm going to go walk you through the 10 most important lab tests that can help you to find out what's happening in your body.

It's important to know the lingo to be able to advocate for your health – and always remember, you know yourself the best!

Note: Some of these tests are best done on particular cycle days.

Cycle day 1 is the first day of your period.

This does not include any days of spotting before your period starts – it's the first day that you wake up with a full period.

1.FSH and LH

Follicle Stimulating Hormone and Luteinizing Hormone

These are two important **pituitary hormones** (the pituitary is the tiny master gland within our brains that controls the hormonal system) – and they message the ovary, telling it to prepare an egg for ovulation.

FSH helps grow the egg in the first half of the cycle, and LH triggers the actual process of ovulation. They work together to regulate the connection between the brain and the ovary. The best time to measure these hormones is on cycle day 3.

The ratio between these two pituitary hormones means A LOT.

Normally, the LH should be half of the level of the FSH – or at the very most – the same.

If this ratio is reversed, and the **level of LH is double that of FSH** on cycle day 3 – this is a possible sign of PCOS.

The levels of FSH and LH mean a lot, too.

If both FSH and LH are very high on cycle day 3 – particularly if they are over 10 iu/L – you may have concerns with egg quality or may be approaching perimenopause.

2. PROGESTERONE

Progesterone is such an important hormone for a woman's wellbeing – it's secreted by a special structure known as the corpus luteum that resides in the ovary, and it's secreted only after ovulation has happened.

Progesterone is often measured on day 21, or if you don't ovulate regularly on cycle day 14 – it's best measured 7 days post ovulation.

Levels higher than 16 nmol/L strongly suggest that you have ovulated.

Also, ratios of estradiol to progesterone can be calculated in order to get an idea of progesterone sufficiency for hormonal balance and possible luteal phase defect (a common fertility concern).

Low progesterone can make you feel anxious, irritated and suffer with insomnia and PMS. It can cause difficulty with implantation, and cause dysregulation of the menstrual cycle such as spotting and heavy bleeding.

3. ESTRADIOL

Estradiol is best measured on day 3 of the cycle, or in conjunction with progesterone on cycle day 21.

If elevated, estradiol can lower the fsh, thereby masking high fsh levels and perimenopause. This can happen in cases of low ovarian reserve or functional cysts.

Interestingly, estradiol can also be low when there is a low ovarian reserve or in menopause.

Women whose estradiol on day 3 is over 294 pmol/L (Canadian units) (or 80 pg/ml in US units) may have problems with ovulation as the estrogen is being secreted from follicles that began developing early, on the cycle before. This is often caused by low egg quality (lower quality eggs don't regulate themselves to develop at the right rate, and develop too early), however it can also be caused by a functional ovarian cyst.

4. CORTISOL

Often measured in the morning when blood tests are taken (7-8am is optimal), cortisol is our stress hormone that modulates so much of the function in our bodies. It affects the immune system, female hormones, thyroid and metabolism. Elevated cortisol can affect ovarian circulation and function.

Normal levels : 250 – 850 nmol/L taken between 6-8am.

Low cortisol can be found in congenital adrenal hyperplasia, a syndrome that mimics PCOS. Women with PCOS often have higher than average levels of cortisol.

The best overall test for cortisol is 4 point salivary measurement, which assesses the diurnal pattern of this key hormone involved in our sleep, immune function and stress. Our cortisol rises up in the morning to wake us up – and then it decreases through the day to reach it's low point at night – helping us to fall asleep.

5. DHEA-S

This is a wonderful hormone, secreted by our adrenal glands. It is a precursor hormone – it can be made into testosterone and to a lesser degree, into estrogen. DHEA-S is made ONLY by the adrenals, which is what makes it a wonderful test, as it's a direct marker of adrenal hormonal function. DHEA-S is highest when we are young, as teenagers and declines with age. As such, the DHEA values MUST be interpreted with age in mind.

Low levels of DHEA-S are commonly seen in patients who have adrenal fatigue. They are also associated with reduced egg quality in women who are trying to conceive.

High levels of DHEA-S are seen in women with PCOS who have adrenal androgen excesses. This is a [specific factor in PCOS](#) that is very important to address separately. My upcoming book has an entire section dedicated to the adrenals and this issue.

6. TESTOSTERONE

Testosterone is a key hormone for women. It's produced primarily by our ovaries although some is also produced by the adrenal glands. It gives us libido, improves our muscle mass, increases alertness and visual acuity, boosts our mood and is essential for female fertility.

Too little testosterone can make us tired, flatline our libido, and give us brain fog. Low testosterone can be seen in patients who have adrenal fatigue, who have low egg reserve, or who are peri-menopausal.

Too much testosterone is also an issue. Women with PCOS often have elevated testosterone levels. Excess testosterone is produced by a thickening of the outer layer of the follicles in the ovary – disrupting the ovulatory process and bringing menstrual cycles to a halt.

Testosterone can also turn into DHT (a very strong form of testosterone) in the skin. Too much DHT causes hirsutism (coarse hair growth on the face, or chest), acne (particularly along the jawline) and hair loss.

There are various markers of testosterone but my favorites are free and total testosterone. These show not only how much testosterone is being produced – but also how much is free floating (not bound to protein) and available to attach to receptors. High levels of insulin cause more testosterone to float freely around the body, a problem for women with PCOS.

When it comes to testing – younger women naturally have higher levels of testosterone. As such, you may want to ask an expert in PCOS to help interpret your levels with respect to your age – as the reference ranges include all ages.

What is high for a 35 year old woman, would not necessarily fall outside of the normal range. In addition, there may be high tissue levels of hormones that are not reflected in the blood. So, do not use serum testosterone to rule out PCOS – I've seen hundreds of women with PCOS who have normal levels of testosterone on blood testing.

7. AMH

Antimullerian Hormone

Antimullerian hormone is a very important hormone for women of reproductive age. This value generally correlates with the number of follicles in the ovaries – that's right – it's your egg-counter.

Generally, the higher the AMH, the more follicles are in the ovary. Antimullerian hormone can even predict the age of onset of menopause with some degree of

accuracy. As such, AMH levels must be interpreted with age in mind – younger women have higher levels than older women. Note that there are two different units for PCOS – so it's important to figure out which unit your test was measure in before trying to figure out where you are at.

Typical AMH Levels

Age	AMH	
Under 33 years old	2.1 -6.8 ng/dl	15.0 – 48 pmol/L
33-37 years old	1.7 – 3.5 ng/dl	12.14 – 32.13 pmol/L
38-40 years old	1.1 – 3.0 ng/dl	7.8 – 21.42 pmol/L
41+ years old	0.5 – 2.5 ng/dl	3.57 – 17.85 pmol/L

AMH and Fertility

Optimal fertility	4.0 – 6.8 ng/ml	28.6 – 48.5 pmol/L
Satisfactory fertility	2.2-4.0 ng/ml	15.7 – 28.6 pmol/L
Low Fertility	0.3-2.2 ng/ml	2.2-15.7 pmol/L
Very low fertility	0.0-0.3 ng/ml	0.0-2.2 pmol/L
Likely PCOS	above 6.9 ng/ml	above 48.5 pmol/L

At any age, an AMH over 6.8 ng/dl (or 48 pmol/L) is considered high and potentially a sign of PCOS.

Low AMH means that it may take longer for a woman to conceive, since there are less follicles in the ovary which is why this is associated with fertility issues. However, even if AMH is low, conception is still possible – we've seen many women with low AMH get pregnant and carry to term.

High levels of AMH are often found in PCOS – this is because women with PCOS have a greater number of follicles – and their individual follicles also secrete more AMH! For more information on AMH and PCOS please read [here](#).

This is a great test to assess ovarian health and one I highly recommend for all women of reproductive age.

8. THE ESSENTIAL THYROID PANEL

TSH, Free T3, Free T4 Reverse T3, Anti TPO and Anti TG

Although many doctors will recommend testing only the TSH, this is definitely not going to give you a full understanding of your thyroid health.

TSH is the pituitary hormone which tells your thyroid gland to produce thyroid hormone. For pregnancy and for fertility, the American Thyroid Association recommends an upper limit of 2.5 mIU/l. For general health, anything above 3.0 mIU /l is suspicious of subclinical hypothyroidism.

T4 is the primary hormone secreted by your thyroid, along with smaller amounts of T3. T4 is an inactive hormone, that is a reservoir – when needed, your body tissues will convert T4 into the active hormone T3.

T3 is the main hormone that our bodies use to run the metabolism. It's important to look at the ratio between T4 and T3 to understand how well your body is converting the hormone. Even if your TSH is normal, and you are not converting, you'll still experience the symptoms of hypothyroidism such as fatigue, weight gain and mood changes.

For optimal health, I generally like to see the T4 in the upper 1/3 of the range, and the free T3 in the upper 1/4 of the range.

Another important part of the thyroid panel that is rarely tested is **reverse T3**. Your body can convert T4 into reverse T3 when it needs to preserve energy. As reverse T3 is inactive, having high levels is also associated with the symptoms of hypothyroidism.

The ratio of free T3 to reverse T3 should be 20 and above.

Anti TPO (Anti thyroid peroxidase) and Anti TG (Anti thyroglobulin) are the two autoimmune antibodies that attack the thyroid gland. Women who have high levels of these antibodies are diagnosed with Hashimoto's thyroiditis.

When these antibodies are high, the immune system views the thyroid as a foreign invader, and the T cells begin to mount an attack against it – destroying the thyroid cells within. This causes hypothyroidism over time.

Women who have high anti-thyroid antibodies may also experience fluctuations in their thyroid hormone levels, depending on how the immune system is behaving at the time. When the immune system attacks the thyroid, there are times when thyroid hormones can be released in a burst into the system followed by long periods of increasing hypothyroidism.

9. FASTING INSULIN AND GLUCOSE

These two key metabolic markers are used to calculate the levels of insulin resistance.

Here's something important to know – measuring your glucose levels alone means relatively NOTHING with respect to insulin resistance!

That's right – you can have completely normal blood sugar and have raging insulin resistance!

In fact, many women with insulin resistance even have low glucose levels. Why?

Insulin resistance is not diabetes.

Insulin resistance happens for years before diabetes develops. Measuring fasting insulin and fasting glucose together, and calculating the ratio between the two, can give you early warning signs of insulin resistance. This is called the HOMA-IR – downloadable calculators are available online.

I always aim for a fasting insulin level below 50 pmol/L (under 7 uIU/mL) in my patients and a HOMA-IR of under 1.0.

A more sensitive test is the insulin-glucose challenge test – this can pick up insulin resistance, at the most early stages. This test is done over 4 hours and is quite involved but I've seen it pick up patients with early stages of insulin resistance – and this can be the key for treating PCOS and managing a healthy weight.

Insulin Resistance is a major health problem for women - as it aggravates PCOS by increasing the production of testosterone, and makes weight loss challenging. It's inflammatory and is associated with chronic disease.

10. hs-CRP

Ok, so this one this is not a hormone. That being said, it's such an important test for women's health, and I couldn't leave it off the list.

CRP is a marker of inflammation in the body. It's produced by the liver – and it's associated with a variety of different health conditions including inflammation, autoimmunity, PCOS and weight gain.

There are no external signs of elevated CRP.

I always recommend that women ask for an hs-CRP, rather than a CRP. Hs stands for “high sensitivity” and it's able to measure inflammation at the micro-vascular level. A level over 3.0 is considered quite high – and most healthy women are below 2.0. In patients who have an autoimmune disease, such as rheumatoid arthritis – this number can be over 10!

These tests can help you and your doctor to figure out the pieces of your hormonal puzzle. Don't forget that we can help you = hormones are complicated and they need to be looked at with a comprehensive view!

Here's what to do next:

Share [this link](#) with a friend, so that all women can access this e-book, and learn what the most important hormone tests mean about their health!

I'll be sending along more useful information in the future to you, and I'll let you know about my upcoming book release, too.

With gratitude,

Dr. Fiona McCulloch BSc RAc ND

