balance
the menopause support app

Understanding hormone levels in the blood

Hormone blood tests are not usually needed to make a diagnosis of the perimenopause or menopause but they can be useful for some women to monitor the effects of hormone replacement therapy (HRT).

What is measured when I have a blood test?

The most common reason for doing a blood test as part of menopause care is to check the levels of hormones in the blood. Specific tests look at levels of estradiol (estrogen), testosterone and SHBG (sex hormone binding globulin).

Estradiol

An estradiol test measures the level of estrogen in the body but only at the time the blood was taken. Estradiol levels can vary and change from day to day – even at different times throughout the same day. During the **peri**menopause you see greater fluctuations in hormone levels; estradiol levels can be very high and also be very low, so they are not an accurate way of diagnosing the menopause.

SHBG

SHBG is a protein that binds to certain hormones, including testosterone and estradiol, and it carries these hormones throughout your bloodstream. When hormones are bound to SHBG they're not available for use. If your SHBG levels are low, your body has more unbound sex hormones available for use. If your SHBG levels are high, your body has fewer unbound sex hormones at its disposal.

Testosterone

Testosterone and SHBG levels are checked at the same time and a ratio of them is worked out (and multiplied by 100) to give the Free Androgen Index (FAI) score, which is given as a percentage. The FAI score gives clinicians a guide as to how much freely available (unbound) testosterone is present in a woman's body.

Follicle Stimulating Hormone (FSH)

FSH levels are sometimes checked to help diagnose the menopause in younger women. FSH is a hormone produced by the brain to stimulate the ovaries to produce estrogen. It usually becomes raised when a woman is menopausal. However, levels of this hormone can really fluctuate and while a raised level can be helpful to know about, a lower / 'normal' level doesn't exclude the possibility of you being perimenopausal or menopausal.

Diagnosing perimenopause or menopause

Diagnosis of the perimenopause and menopause is usually confirmed by looking at a woman's symptoms rather than by blood test results. Hormone levels in the blood can be very misleading if they are normal because it just means the levels were normal at the time of the blood test and doesn't reflect how hormone levels change at other times of the day or across the month as a whole. If older than 45 years, a woman's account of her symptoms is enough on its own to diagnose perimenopause or menopause.

Why are hormone levels useful to know?

Estradiol levels are most useful for checking how well a treatment is working. They are not that accurate if the woman takes estrogen as a tablet, but they can be very useful for women who take estrogen as a patch, gel or spray, to confirm if enough estrogen is being absorbed through the skin into your bloodstream.

It is important to have adequate estrogen levels in the blood in order to improve symptoms and also reduce the risk of disease in the future. If estradiol levels are too low, there is still an increased risk of diseases such as heart disease, osteoporosis, diabetes and dementia. Young women often need to have higher doses of estrogen in their HRT to achieve physiological (effective) levels of estradiol.

On its own, a low testosterone and FAI level doesn't mean a woman needs to take testosterone. However, if she has symptoms suggestive of testosterone deficiency such as fatigue, memory problems, brain fog, reduce stamina, muscle and joint pains and reduced libido, and she *also* has low testosterone and FAI, it's likely she would benefit from taking testosterone. Testosterone and SHBG levels are then done at frequent intervals (at least annually) to ensure levels are kept in the normal range for women who use testosterone as a gel or cream.

What are normal ranges?

In most cases, it's beneficial to achieve 'physiological' levels, which means levels similar to women who have periods. Generally, this means estradiol levels above 250 pmol per litre, but some women need higher levels than this to really improve their symptoms. Women do not normally need to have levels more than 1000 pmol per litre.

Levels of testosterone and SHBG vary between women but generally their FAI should be less than 5%.

Why higher-than-licensed doses of estrogen are sometimes needed

Many women need higher doses of estrogen than is licensed for the medication. This is not dangerous; it's important for women to have adequate hormones to improve their symptoms and to protect their health for the future.

Some women do not absorb the estrogen in the gel, patches or spray as easily as others, so they might need a higher dose to penetrate the skin and become absorbed into the bloodstream.

Other women metabolise hormones at different rates so may need to have higher doses to achieve the same levels.

It's very common in medicine to use different doses of medication and tailor it to the individual. This is especially true of hormones in different women. For example, women with underactive thyroid glands often have different doses of thyroxine to each other, in order to normalise their thyroid function tests.

Taking a measure of hormone levels in the blood can be useful for some women to help clinicians choose the most effective and appropriate dose of HRT. Because hormones vary greatly from day to day, it's always important to consider the whole clinical picture, especially taking into account how a woman feels and how her symptoms have changed, and use this information to help decide the best course of action.