

A photograph of four women of different ages and ethnicities standing together, with the nara logo overlaid. The women are dressed in light-colored shirts. The background is a solid, warm orange color. The logo 'nara' is in a white, lowercase, sans-serif font, positioned in the center of the image.

nara

Women's Hormonal Health DNA Report

NARA

Women's Hormonal Health DNA Report

WILL INCLUDE:

***IMPORTANT NOTE:** Because this report deals with genetic, hormonal, and biological mechanisms, it pertains solely to individuals born with two x chromosomes, or in a biologically female body. If you are a transgender woman, transgender man, or non-binary person undergoing hormone therapy, or if you were born with an X and a Y chromosome, this report is unlikely to adequately address your unique needs. For this reason, it's best to consult with a qualified and informed medical professional on matters pertaining to your hormonal health.*

YOUR HORMONAL PROFILE

CORTISOL

DEHYDROEPIANDROSTERONE (DHEA)

ESTROGEN

ESTROGEN METABOLISM

PROGESTERONE

SUGGESTED FURTHER TESTING

APPENDIX

***DISCLAIMER:** The insights provided in this report are only for educational purposes, not for the prediction, diagnosis, or treatment of any health disorder. Please consult your healthcare provider for specific diagnosis and treatment guidelines.*

YOUR HORMONAL PROFILE

Hormone	Your result interpretation	Your DNA score & Impact on hormone function
Cortisol	Increased/decreased cortisol metabolism which may affect neural health	<div><div></div><div></div><div></div></div> <div>Score=0-1</div>
DHEA	Increased/decreased DHEA levels which may affect reproductive health	<div><div></div><div></div><div></div></div> <div>Score=0-1</div>
Estrogen	Increased/decreased estrogen levels which may affect reproductive health	<div><div></div><div></div><div></div></div> <div>Score=0-1</div>
Estrogen metabolism	Normal/abnormal estrogen metabolism which may affect reproductive health	<div><div></div><div></div><div></div></div> <div>Score=0-1</div>
Progesterone	Increased/decreased progesterone levels which may affect reproductive health	<div><div></div><div></div><div></div></div> <div>Score=0-1</div>

CORTISOL

Cortisol, a steroid hormone, is released from the adrenal glands (which are located on the kidneys) in response to stress [ref]. When your cortisol levels are functioning normally, they should rise in the middle of the night, peak in the morning, and decline in the evening [ref]. According to the latest research, high cortisol levels may have a significant impact on how your body functions — affecting everything from blood pressure, to bone density, to risk of certain diseases.

What happens when you have high cortisol levels?

People with consistently high cortisol may experience any of the following symptoms [ref]:

- Weight gain (especially around the midsection)
- High blood sugar (which can increase risk of type 2 diabetes)
- High blood pressure
- Wide, purple stretch marks on abdomen
- Muscle weakness impacting the thighs or upper arms
- Excessive hair growth on the face and body (hirsutism)
- Low bone density and osteoporosis

Your Results

Gene	Your Risk Status	Impact on Stress Response	Genetic impact
FKBP5	Increased/Decreased	Negative/Normal	<div><div></div><div></div><div></div></div> <div>Score=0-1</div>

*People with these gene variants may have an elevated risk of excess cortisol.

What can happen if high cortisol levels are left untreated?

If your cortisol levels remain high for an extended period of time, you may experience negative health repercussions including [ref]:

- Inflammation
- High blood pressure
- High blood sugar
- Type 2 diabetes
- Dysregulated metabolism of fats, proteins, and carbohydrates
- Bone-related problems

Cortisol:

A Closer Look at the Science

In the event of stress, the hormonal axis (HPA-hypothalamus-pituitary-adrenal axis) is activated, and with persistent activation, your body will produce elevated levels of cortisol. Because of this, cortisol is often used as a biomarker to indicate HPA axis dysregulation.

Cortisol is produced from progesterone, a biologically female reproductive hormone. In the event of chronic stress, consistently high levels of cortisol may significantly deplete progesterone. This causes a shift in estrogen-progesterone balance, and can disrupt each hormone's role in biological function [\[ref\]](#).

Based on the review of multiple clinical studies, elevated cortisol levels were linked with cognitive decline and contributing factors toward Alzheimer's disease pathology [\[ref\]](#). A meta-analysis suggested that elevated morning cortisol is associated with an increased risk of developing adolescent depression [\[ref\]](#). Findings summarized in a review showed dysregulated hormonal axis (HPA) can cause elevated cortisol which is associated with insulin resistance and type 2 diabetes [\[ref\]](#). Another review highlighted the importance of cortisol in circadian rhythm, and demonstrated that increased cortisol levels correlate with an increased risk of cardiac events [\[ref\]](#).

DEHYDROEPIANDROSTERONE (DHEA)

DHEA is a precursor of the female reproductive hormones estrogen and progesterone, produced primarily by the adrenal glands (which are located on top of kidneys) and in small amounts from reproductive organs. DHEA levels decrease as we age, impacting how the rest of the steroid hormones function.

What happens when you have low DHEA levels?

Low DHEA may be associated with any of the following symptoms [ref][ref]:

- Excessive hair growth on the face and body (hirsutism)
- Low bone density and osteoporosis
- Depression
- Low libido
- Heart disease
- Obesity

Many of these symptoms overlap with potential effects of low estrogen or testosterone levels. This is because DHEA is the precursor of both of these important hormones — meaning that inadequate DHEA may also impact estrogen and testosterone levels.

Your Results

Gen	Your Risk Status	Expected Impact on DHEA Levels	Genetic impact
SULT2A1	Increased/Decreased	Negative/Normal	<div><div></div></div> <div>Score=0-1</div>
BCL2L11	Increased/Decreased	Negative/Normal	
HHEX	Increased/Decreased	Negative/Normal	
TRIM4	Increased/Decreased	Negative/Normal	
CYP2C9	Increased/Decreased	Negative/Normal	
ZKSCAN5	Increased/Decreased	Negative/Normal	

*People with these gene variants may be at a higher risk of reduced DHEA levels.



DHEA:

A Closer Look at the Science

In one clinical study, researchers measured the bone mineral density of healthy males and females, and found that those with the highest blood levels of DHEA had higher bone mineral density than those with the lowest [\[ref\]](#). A related meta-analysis showed increased bone mineral density in the hip area of women using DHEA supplements [\[ref\]](#). DHEA levels may also be positively correlated with fertility. One metaanalysis showed an increased clinical pregnancy with DHEA supplementation, as compared to placebo test group [\[ref\]](#). And finally, DHEA may also help with select depression treatments, as suggested by a meta-analysis of 15 randomized controlled trials that found that, in general, DHEA offered more beneficial effects than a placebo [\[ref\]](#).

ESTROGEN

Estrogen is a steroid hormone produced predominantly by the female reproductive organs, and in small amounts by the adrenal glands and fat cells. While biological males do also produce estrogen, it is often referred to, or perceived as a “female hormone” due to its significance in women’s health. It regulates the menstrual cycle, helps with pregnancy and reproductive system development, reduces bone loss, promotes heart health, and lowers the risk of certain mood-related disorders [ref][ref].

There are three naturally occurring estrogens in women; estrone (E1)-produced in menopause and postmenopause, estradiol (E2)-mainly produced in reproductive years, and estriol (E3)-mainly produced during pregnancy. E2 is the most common type found in women.

*People with these gene variants may be at a higher risk of irregular or increased estrogen levels.

Your Results

Gen	Your Risk Status	Impact on Estrogen Levels	Genetic impact
ESR1	Increased/Decreased	Negative/Normal	<div><div></div><div>Score=0-1</div></div>
LOC101928278	Increased/Decreased	Negative/Normal	
SHBG	Increased/Decreased	Negative/Normal	
ESR2	Increased/Decreased	Negative/Normal	
TNRC9/CASC16	Increased/Decreased	Negative/Normal	

*People with these gene variants may be at a higher risk of irregular or increased estrogen levels.



Estrogen Metabolism:

A Closer Look at the Science

Two major metabolic pathways are operating in the liver; Phase I (hydroxylation) and Phase II (methylation and glucuronidation). Phase I produces three metabolites; 2-hydroxyestrone (2-OH), 16-hydroxyestrone (16 α -OH), and 4-hydroxyestrone (4-OH). 2-OH is considered a good estrogen metabolite due to its weak estrogenic activity whereas the latter two are considered to be potentially harmful estrogen metabolites due to their persistent estrogenic activity which may promote cell growth and increase the risk of potentially cancerous cell growth [\[ref\]](#)[\[ref\]](#).

2-OH and 4-OH are further detoxified via phase II metabolism which makes 4-OH less active and 2-OH into further metabolites with beneficial effects. If phase II metabolism is impaired, 2-OH and 4-OH will not be detoxified and excreted from the body and may damage the DNA [\[ref\]](#). Overall, a healthy and balanced estrogen metabolism promotes the formation of 2-hydroxyestrone.

PROGESTERONE

Progesterone is another imperative steroid hormone. It is produced by the female reproductive organs, placenta (during pregnancy), and adrenal glands. Both biological men and women produce progesterone, but it is produced most abundantly by the ovaries.

Progesterone and estrogen balance out each other to regulate the menstrual cycle. In addition to its role in the menstrual cycle, progesterone reduces symptoms of menopause, regulates mood, supports thyroid function, and helps with conception and maintenance of early stages of pregnancy,[\[ref\]](#)[\[ref\]](#).

Your Results

Gen	Your Risk Status	Impact on progesterone levels	Genetic impact
Intergenic	Increased/Decreased	Negative/Normal	<div><div></div><div></div><div></div></div> <div>Score=0-1</div>
ZKSCAN5	Increased/Decreased	Negative/Normal	
ZNF789	Increased/Decreased	Negative/Normal	

*People with these gene variants may be at a higher risk of low progesterone levels.

PROGESTERONE Metabolism:
A Closer Look at the Science

APPENDIX

HORMONE BASICS

Your health and wellness are greatly influenced by hormones — chemical molecules that carry messages from your brain to other parts of your body, prompting healthy biological function. This report contains genetic information associated with steroid hormones.

Steroid hormones are a specific chemical class of hormones that are structurally related, and synthesized in the body from a fat molecule known as “cholesterol.” Several physiological processes — including the development of the reproductive system, metabolism, and immune system — are regulated by steroid hormones.

The steroid hormones analyzed in this report include:

- **Cortisol**
- **Dehydroepiandrosterone (DHEA)**
- **Estrogen**
- **Progesterone**

GENES THAT INFLUENCE YOUR HORMONAL HEALTH

How to read my genetic results?

- **Genotype**

The same gene can exist in different forms, or “genotypes.” Your genotype is determined by a pair of alleles, which may be the same (homozygous), or different (heterozygous). Different genotypes come with different inherent risk levels.

- **Your Risk Status**

A decreased genetic risk status does not negatively affect gene function. An increased genetic risk status does negatively may affect gene function and may also be linked to disease.

Limitations of genetic analysis

- Genetic analysis relies on genetic markers, which are only one contributing risk factor among several others. Non-genetic risk factors include dietary intake and physical activity — both important contributors to your overall hormonal health.
- Your genetic risk is calculated based on a limited number of genetic markers. There are other possible genetic variants that are not included in this analysis.

GENES THAT INFLUENCE YOUR HORMONAL HEALTH