

Giddy

The Role and Impact of Estrogen

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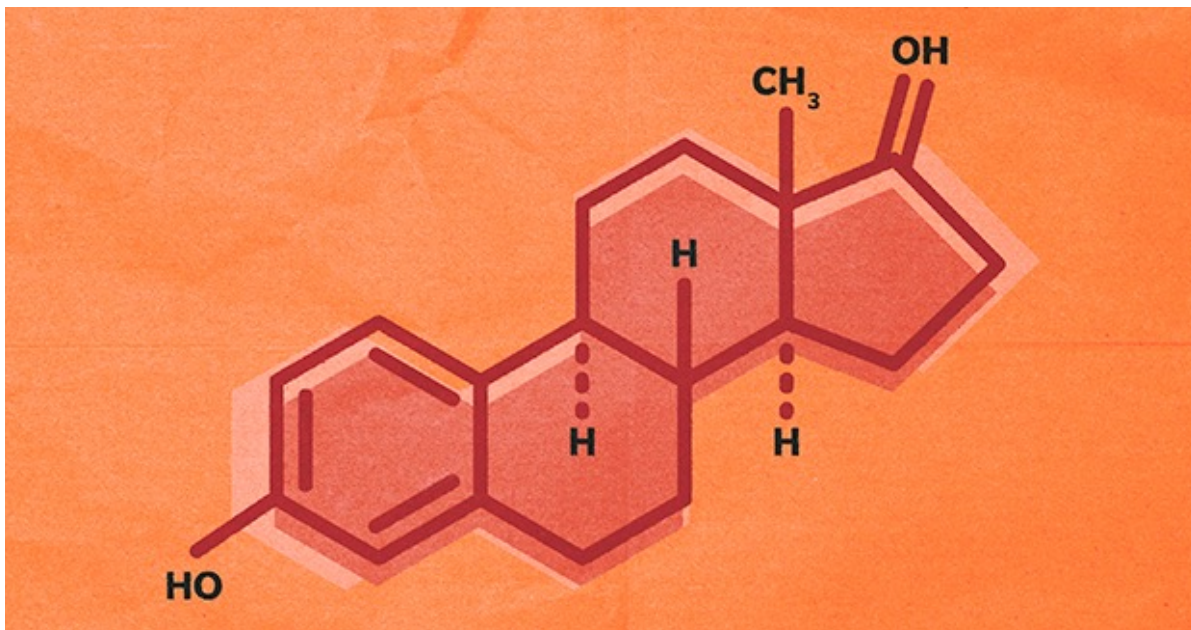


illustration by Tré Carden

Estrogens are a group of hormones that are crucial for sexual development. While estrogens are most known to impact reproductive health, they also help with myriad functions such as metabolism, cardiovascular health and bone development.

“Estrogen is a sex hormone responsible for reproductive growth and development in women. There are four types of estrogen made in the body. Three of the most important types are estrone, estriol and estradiol. Of those three types, estradiol is the strongest and most influential in the body,” explained [Thais Aliabadi, M.D.](#), a board-certified OB-GYN in California and founder of Trimly, a weight-loss treatment.

While estrogen is essential to the reproductive system for women, the hormone is also present in men, but usually in a lesser amount.

The role of estrogen

“Some notable female reproductive processes driven by estrogen are puberty, ovulation, menstruation, pregnancy, fertility and menopause,” Aliabadi said. “Estrogen plays a key role in the regulation of the female reproductive system and development of secondary sex characteristics, such as breasts.”

During puberty, estrogen levels increase, and as estrogen rises, secondary sex characteristics form. At this time, estrogen aids in the development of bones. Estrogen also helps with changes during puberty, such as developing breasts, hips and armpit hair.

Along with progesterone, estrogen plays a vital role in menstruation. During the 28-day menstrual cycle, estrogen levels rise and fall twice. Right before someone begins menstruating, estrogen levels drop, contributing to premenstrual syndrome (PMS) symptoms such as headaches. During the follicular phase of menstruation, which starts after a period and ends in ovulation, estrogen helps the uterine lining, or endometrium, thicken to prepare for pregnancy. Estrogen also plays a key role in ovulation, which occurs when the ovaries release a mature egg to the fallopian tubes.

Estrogen-induced changes also impact fertility. During the menstrual cycle, estrogen rises leading up to ovulation. Concurrently, estrogen helps thin cervical mucus, making it easier for sperm to swim and join a mature egg, causing fertilization to occur. An estrogen increase around ovulation makes it easier to become pregnant.

During pregnancy, estrogen helps the uterus support a pregnancy to grow and helps with organ development. When someone is pregnant, estrogen production is at its highest. Estrogen also impacts milk duct development and can cause fuller breasts. After pregnancy and during breastfeeding, estrogen levels decrease.

Estrogen also contributes to vaginal wellness. The sex hormone helps thicken the vaginal walls and contributes to elasticity and moisture. In addition, sometimes menopausal women take estrogen to help with vaginal dryness. Estrogen also helps maintain a normal vaginal pH, which helps to prevent infections.

While estrogen plays a crucial role in maintaining reproductive system functions, it also impacts other systems.

“As the main sex hormone for females, estrogen is necessary for normal sexual and reproductive development,” Aliabadi said. “Estrogen also works on many non-reproductive body systems. It influences metabolism, cholesterol, the skeletal system or bones, DNA repair, sex drive, memory, mental health and our immune system.”

Estrogen also impacts cardiovascular and musculoskeletal health.

Estrogen has many useful roles. Sometimes it is taken orally or vaginally for vaginal symptoms such as dryness from menopause or as part of hormone therapy for transgender, nonbinary or gender-nonconforming individuals, which is also referred to as feminizing hormone therapy, because of estrogen’s role in “female” characteristics.

How estrogen is produced

In the reproductive years, the ovaries produce the majority of estrogen and the sex hormone progesterone. Developing follicles in the ovary produce estrogen. While estrogen is produced mainly in the ovaries, it’s also made by the adrenal glands and in adipose, or fat tissue, Aliabadi explained. The adrenal glands, which are located at the top of the kidneys, produce a smaller amount of estrogen than the ovaries. After menopause, the ovaries stop making as much estrogen.

When pregnancy occurs, estrogen production changes.

“During pregnancy, estrogen is made by the placenta,” Aliabadi said.

The placenta typically takes over estrogen production by the end of the first trimester, helping to maintain the pregnancy. The placenta also produces progesterone.

What can affect estrogen?

Multiple factors can influence estrogen levels. It's normal for estrogen levels to fluctuate over the course of a month and life span. Natural life transitions such as puberty or menopause affect estrogen levels. Age also plays a significant role, as estrogen levels drop when someone stops ovulating.

However, certain lifestyle factors also play a role.

“There are many factors that influence estrogen production,” Aliabadi explained. “Some significant factors include puberty, pregnancy and breastfeeding.”

However, age, being over- or underweight, stress, eating habits and medications also play significant roles, according to Aliabadi.

The ovaries are responsible for producing the largest amount of estrogen, so surgical removal of the ovaries, such as a complete hysterectomy, impacts estrogen levels.

High stress levels can impact the adrenal glands' production of cortisol and adrenaline, and an increased level of stress hormones can negatively impact estrogen. Similarly, too much caffeine also causes an increase in stress hormone production, which negatively impacts estrogen levels. Further, both smoking and alcohol consumption can influence estrogen levels.

Endocrine-disrupting chemicals (EDCs) are human-made chemicals that can interfere with estrogen. EDCs are found in pesticides, cosmetics, cleaning products and plastics. These chemicals mimic estrogen-like responses, create adverse health outcomes and impact hormone balance.

Poor sleep or insomnia can also increase hormone imbalances. Similarly, food plays a role; diets high in red meats, sugar and refined grains can lead to higher estrogen levels. Autoimmune disorders can also affect estrogen because of estrogen's vital role in the immune system. Lifestyle changes, such as more sleep and an improved diet, can help balance estrogen levels.

Estrogen is involved in multiple critical bodily functions, such as governing reproduction and development. While it's produced by the ovaries, fat cells and adrenal glands, this sex hormone can also be taken artificially.

An estrogen imbalance can lead to varying symptoms due to widespread factors such as lifestyle, surgery, exposure to chemicals and medication. Before taking any artificial hormone, schedule an appointment with your healthcare provider.

<https://getmegiddy.com/role-impact-estrogen>