

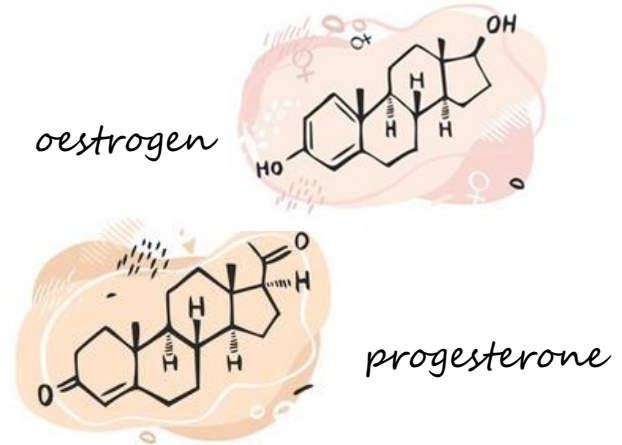
Oestrogen and progesterone replacement therapy: a general guide for patients and families

Please read **Puberty and the importance of sex hormones** before reading this factsheet.

Puberty

You have already heard about puberty and discussed what to expect with your doctor.

Pubertal changes usually begin around 11 to 12 years of age as we develop from children into young adults and usually lasts 4 or more years. Although many different hormones work together in puberty, the sex hormones from the ovaries are especially important.



The best hormone replacement therapy for girls who do not have their own oestrogen and progesterone is the type that is available and acceptable to her. If you have any questions, please speak to your care team, so we can best support you.

Oestrogen causes the breasts to grow, the body to develop a 'female' shape and the bones to become denser and stronger. It also allows the sexual reproductive system (uterus, fallopian tubes, cervix, vagina and outer genital area) to mature and stay healthy.

Progesterone, the other sex hormone made by the ovaries, keeps the lining of the uterus at a safe thickness (by controlling periods).

If your body does not make oestrogen and progesterone, your doctor will discuss replacing these hormones. This is called **hormonal replacement therapy**. Hormone replacement therapy involves taking medications to replace the hormones that your body cannot produce. Some girls don't have a uterus and therefore don't need progesterone, but all girls need oestrogen during puberty and beyond because of its important and positive effects on the body.

When to start?

Oestrogen is usually started at around 11 to 12 years of age – at a similar time to when many other young people are starting puberty. The starting dose is very low and is slowly increased, usually every 6 to 12 months, to keep pace with what would happen naturally.

If you have a uterus, progesterone is usually started after you have been on oestrogen for 2 to 3 years, or if you have had some bleeding from the vagina (a period or break through bleed). By this time, your breasts should be mature and your uterus a good size with a thick inner lining. A pelvic ultrasound may be arranged to check your uterus.

When progesterone is added to your hormone treatment, you will take this for **two weeks** of the month followed by a period while continuing to take oestrogen **every day**. You can find a more detailed example treatment plan on page 4.

How long will I need hormonal replacement?

Hormone replacement therapy is not only important for puberty but also to keep many other body systems healthy until at least 50 years of age.

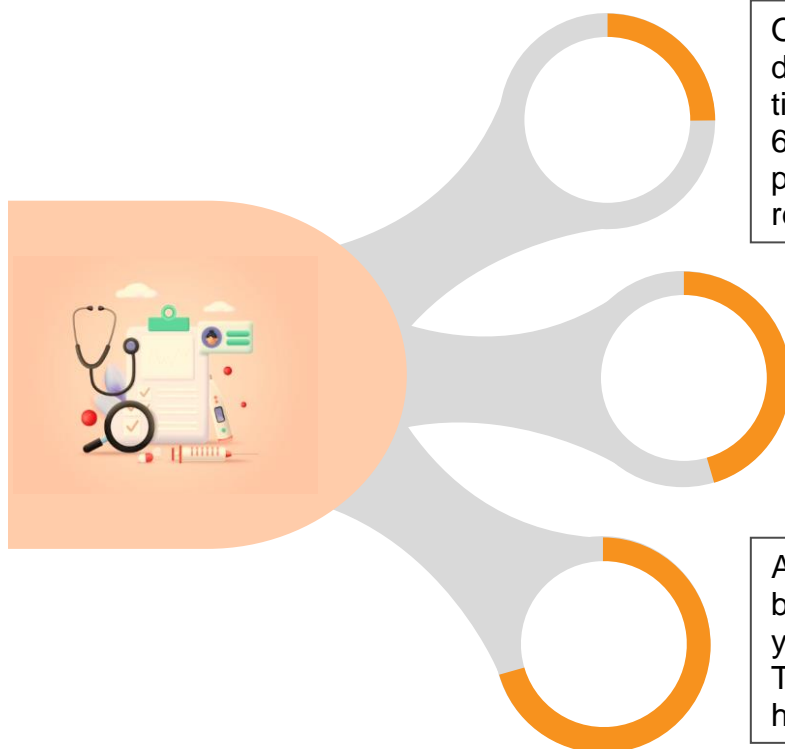
How are the hormones given?

Oestrogen can be given as either daily tablets or patches that you stick to the skin and change twice per week. These hormones are 'natural', the same as those that a body typically produces. It's thought that oestrogen patches (oestrogen absorbed through the skin) might be better for you than tablets, but there are pros and cons with both, and your doctor will discuss these with you.



Progesterone is usually given as a tablet or capsule for 12 to 14 days every month.

How is the therapy monitored?



Oestrogen affects body growth and breast development amongst many things. Each time you come to clinic, usually every 6 months, your height, weight, blood pressure and progress of puberty will be reviewed to adjust your oestrogen dose.

Blood tests for hormone and other important body chemistry levels will be arranged every 6 to 12 months and X-rays for bone age (maturity) every year.

A scan for bone density might be performed before beginning hormone replacement if you have any risk factors for thin bones. The bone scan will be repeated when you have reached adult doses of oestrogen.

What to expect from hormone replacement?

Treatment helps your body go through the changes of puberty at a similar rate to other young people. These changes usually happen gradually over 3 to 4 years. Oestrogen and progesterone support development of features such as breast growth and menstrual periods. However, they do not help the ovaries make new eggs, so they do not improve fertility. They also do not cause pubic and underarm hair growth – these are caused by hormones called androgens, mostly coming from the adrenal glands.

Compassion

Excellence

Collaboration

Accountability

Equity

Respect

What are possible side-effects?

The more common side-effects of treatment are usually minor and the same as those that are experienced by many young women during natural puberty. Oestrogen may cause breast tenderness, nausea, bloating, fluid retention and headache. Similarly, progesterone can also cause breast tenderness, headaches, fluid retention, mood swings and premenstrual-like symptoms.

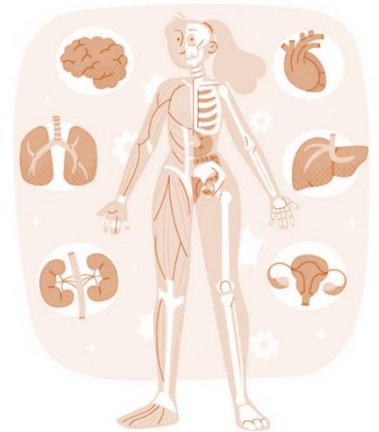
If you do experience any of these side-effects, discuss them with your doctor as the type of hormone, route or dose can be adjusted to better suit your needs.

Please see the Transdermal Estradiol Patches information sheet for practical tips.

More detail on oestrogen for those who want to know more

Oestrogen replacement therapy aims to:

- Help the development of secondary sexual characteristics, particularly breast growth and maturation
- Help the growth of the uterus, if present, to an adult size and shape; a uterus that is too small may cause problems with fertility and pregnancy outcomes
- Achieve a good adolescent growth spurt
- Achieve normal peak bone mass in adulthood
- Support psychological maturation and adjustment.



Oestrogen also affects many body systems beyond the sexual reproductive system:

Bone mass: it is responsible for bone mass accumulation and therefore bone strength, decreasing the risk of osteopenia, osteoporosis and later fracture.

Skeletal maturation: low dose oestrogen causes growth of bones but at high concentrations it also begins to close the area where bones grow (growth plate). It therefore can change final height as well as skeletal shape e.g. widened pelvis, and different body proportions.

Body composition: oestrogen increases fat storage particularly in areas such as the breasts, buttocks, hips and thighs (preparation for pregnancy, breast-feeding).

Cardiovascular system: lack of oestrogen increases the risk of cardiovascular disease, in particular heart attacks and stroke; the transdermal skin patches are best if there is a moderate to high risk of cardiovascular disease.

Blood pressure: oestrogen tends to lower blood pressure.

Skin health: lack of oestrogen is associated with accelerated skin aging with decreased skin collagen content, skin thickness and elasticity and hydration.

Liver function: oestrogen has a protective effect on liver function.

Metabolic effects: oestrogen decreases the risk of diabetes and insulin resistance, by improving lipid (fat) patterns.

Neurocognitive and psychosexual development: are promoted by the effects of oestrogen.

Can support psychological issues of delayed puberty with decreased self-esteem, social withdrawal, anxiety as well as sexual inactivity in later life.

Breast cancer: any increase in this risk is very small and more related to which progestogen is used. In some populations such as Turner Syndrome, the long-term risk of breast cancer after prolonged oral or transdermal oestrogen remains much lower than among women in the general population.

Venous thromboembolic disease: the background risk of this is very low and the small increase in risk can be minimised by using body identical hormones and the transdermal route for oestrogen.

Example of hormonal replacement therapy treatment

Adapted according to each young person's response to treatment

Timing	TDE2	Oral E2	Breast stage	E2 level	Progesterone
Year 1: 1-12 months	¼ x 25 mcg patch, changed twice/week	½ x 1 mg oestrogen tablet second daily	Stage 2 by end of time period	<50pmol/L	
Year 2: 13-24 months	½ x 25 mcg patch	½ x 1 mg oestrogen tablet daily	Stage 3	50-150pmol/L	
Year 3: 25-36 months	25-37.5 mcg patch	1mg tablet daily	Stage 4	150-450pmol/L	200 ug micronized progesterone x 12-14 days/month
Year 4: 36-48 months	50-100 mcg patch	2 mg tablet daily	Stage 4-5	375pmol/L	200 ug micronized progesterone x 12-14 days every 1-3 months

TDE = Transdermal oestrogen E2 = oestrogen mcg or ug = micrograms



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