

Polycystic Ovary Syndrome

Polycystic ovary syndrome (PCOS) is common. It can cause period problems, reduced fertility, excess hair growth, and acne. Many women with PCOS are also overweight. Treatment includes weight loss (if you are overweight), and lifestyle changes in addition to treating the individual symptoms.

Understanding ovaries and ovulation

The ovaries are a pair of glands that lie on either side of the uterus (womb). Each ovary is about the size of a large marble. The ovaries make ova (eggs) and various hormones. Hormones are chemicals that are made in one part of the body, pass into the bloodstream, and have an effect on other parts of the body.

- Ovulation normally occurs once a month when you release an ovum (egg) into a Fallopian tube which leads into the uterus (womb). Before an ovum is released at ovulation, it develops within a little swelling of the ovary called a follicle (like a tiny cyst). Each month several follicles start to develop, but normally just one fully develops and goes on to ovulate.
- The main hormones that are made in the ovaries are oestrogen and progesterone - the main female hormones. These hormones help with the development of breasts, and are the main controllers of the menstrual cycle. The ovaries also normally make small amounts of male hormones (androgens) such as testosterone.

What is polycystic ovary syndrome?

Polycystic ovary syndrome (PCOS), formerly known as the Stein-Leventhal syndrome, is a condition where at least two of the following occur, and often all three:

- At least 12 follicles (tiny cysts) develop in your ovaries. (Polycystic means many cysts.)
- The balance of hormones that you make in the ovaries is altered. In particular, your ovaries make more testosterone (male hormone) than normal.
- You do not ovulate each month. Some women do not ovulate at all. In PCOS, although the ovaries usually have many follicles, they do not develop fully and so ovulation often does

not occur. If you do not ovulate then you do not have a period.

Therefore, it is possible to have polycystic ovaries without the typical symptoms that are in the syndrome. It is also possible to have PCOS without multiple cysts in the ovary.

How common is polycystic ovary syndrome?

Research studies of women who had an ultrasound scan of their ovaries found that up to 1 in 4 young women have polycystic ovaries (ovaries with many small cysts). However, many of these women were healthy, ovulated normally, and did not have high levels of male hormones.

It is thought that up to 1 in 10 women have polycystic ovary *syndrome* (PCOS) - that is, at least two of: polycystic ovaries, a raised level of male hormone, reduced ovulation. However, these figures may be higher.

What causes polycystic ovary syndrome?

The exact cause is not totally clear. Several factors probably play a part. These include the following:

Insulin

Insulin is a hormone that you make in your pancreas (a gland behind your stomach). The main role of insulin is to control your blood sugar level. Insulin acts mainly on fat and muscle cells causing them to take in sugar (glucose) when your blood sugar level rises. Another effect of insulin is to act on the ovaries to cause them to produce testosterone (male hormone).

Women with PCOS have what is called insulin resistance. This means that cells in the body are resistant to the effect of a normal level of insulin. More insulin is produced to keep the blood sugar normal. This raised level of insulin in the bloodstream is thought to be the main underlying reason why PCOS develops. It causes the ovaries to make too much testosterone. A high level of insulin and testosterone interfere with the normal development of follicles in the ovaries. As a result, many follicles tend to develop but often do not develop fully. This causes problems with ovulation: hence period problems and reduced fertility.

It is this increased testosterone level in the blood that causes excess hair growth on the body and thinning of the scalp hair.

Increased insulin also contributes towards weight gain.

Luteinising hormone (LH)

This hormone is made in the pituitary gland. It stimulates the ovaries to ovulate and works alongside insulin to promote testosterone production. A high level of LH is found in about 4 in 10 women with PCOS. A high LH level combined with a high insulin level means that the ovaries are likely to produce too much testosterone.

Hereditary factors

Your genetic makeup is probably important. One or more genes may make you more prone to developing PCOS. PCOS is not strictly inherited from parents to children, but it may run in some families.

Weight

Being overweight or obese is not the underlying cause of PCOS. However, if you are overweight or obese, excess fat can make insulin resistance worse. This may then cause the level of insulin to rise even further. High levels of insulin can contribute to further weight gain producing a 'vicious cycle'. Losing weight, although difficult, can help break this cycle.

What are the symptoms and problems of polycystic ovary syndrome?

Symptoms that occur if you do not ovulate

- **Period problems** occur in about 7 in 10 women with PCOS. You may have irregular or light periods, or no periods at all.
- **Fertility problems** - you need to ovulate to become pregnant. You may not ovulate each month, and some women with PCOS do not ovulate at all. PCOS is one of the most common causes of infertility.

Symptoms that can occur if you make too much testosterone (male hormone)

- **Excess hair growth (hirsutes)** occurs in more than half of women with PCOS. It is mainly on the face, lower abdomen, and chest. This is the only symptom in some cases.
- **Acne** may persist beyond the normal teenage years.

- **Thinning of scalp hair** (similar to male pattern baldness) occurs in some cases.

Other symptoms

- **Weight gain** - about 4 in 10 women with PCOS become overweight or obese.
- **Depression** or poor self-esteem may develop as a result of the other symptoms.

Symptoms typically begin in the late teens or early 20s. Not all symptoms occur in all women with PCOS. For example, some women with PCOS have some excess hair growth, but have normal periods and fertility.

Symptoms can vary from mild to severe. For example, mild unwanted hair is normal, and it can be difficult to say when it becomes abnormal in women with mild PCOS. At the other extreme, women with severe PCOS can have marked hair growth, infertility, and obesity. Symptoms may also change over the years. For example, acne may become less of a problem in middle age, but hair growth may become more noticeable.

Possible long-term problems of polycystic ovary syndrome

If you have PCOS, over time you have an increased risk of developing type 2 diabetes, diabetes in pregnancy, a high cholesterol level, and possibly high blood pressure. For example, about 1 in 10 women with PCOS develop diabetes at some point. These problems in turn may also increase your risk of having a stroke and heart disease in later life. These increased health risks are due to the long-term insulin resistance (and also being overweight which is common in women with PCOS).

If you have no periods, or very infrequent periods, you *may* have a higher than average risk of developing cancer of the uterus (womb). However, the evidence for this is not conclusive and, if there is a risk, it is probably small. A sleeping problem called sleep apnoea is also more common than average in women with PCOS.

Are any tests needed?

Tests may be advised to clarify the diagnosis, and to rule out other hormone conditions.

- Blood tests may be taken to measure certain hormones. For example, a test to measure testosterone and LH which tend to be high in women with PCOS.
- An ultrasound scan of the ovaries may be advised. An ultrasound scan is a painless test that uses sound waves to create images of structures in the body. The scan can detect the typical appearance of PCOS with the many follicles (small cysts) in slightly enlarged ovaries.

Also, you may be advised to have an annual screening test for diabetes or prediabetes (impaired glucose tolerance). A regular check for other cardiovascular risk factors such as blood pressure, and blood cholesterol, may be advised to detect any abnormalities as early as possible. Exactly when and how often the checks are done depends on your age, your weight, and other factors. After the age of 40, these tests are usually recommended every three years.

What is the treatment for polycystic ovary syndrome?

There is no cure for PCOS. However, symptoms can be treated, and your health risks can be reduced.

You should aim to lose weight if you are overweight

Losing weight helps to reduce the high insulin level that occurs in PCOS. This has a knock-on effect of reducing testosterone. This then improves the chance of your ovulating, which improves any period problems, fertility, and may also help to reduce hair growth and acne. The increased risk of long-term problems such as diabetes, high blood pressure, etc, are also reduced.

Losing weight can be difficult. A combination of eating less and exercising more is best. Advice from a dietician, and help and support from a practice nurse, may increase your chance of losing weight. Even a moderate amount of weight loss can help.

Treating hair growth

Hair growth is due to the increased level of the hormone testosterone.

- Unwanted hair can be removed by shaving, waxing, hair-removing creams, electrolysis, and laser treatments. These need repeating every now and then, although electrolysis and laser treatments may be more long-lasting (but are expensive, and are not available on the NHS).
- A cream called eflornithine (Vaniqa) may be prescribed to rub on affected areas of skin. It works by counteracting an

enzyme (chemical) involved in making hair in the skin. Some research trials suggest that it can reduce unwanted hair growth, although this effect quickly wears off after stopping treatment.

- Drugs taken by mouth can also treat hair growth. They work by reducing the amount of testosterone that you make, or by blocking its effect. Drugs include:
 - Cyproterone acetate is an antitestosterone drug. This is commonly combined with oestrogen as a special contraceptive pill called Dianette®. Dianette® is commonly prescribed to regulate periods, to help reduce hair growth, to reduce acne, and is a good contraceptive.
 - The combined contraceptive pill Yasmin® (a combination of ethinylestradiol and drospirenone) has been shown to help if Dianette® is not suitable.
 - Other antitestosterone drugs are sometimes advised by a specialist if the above treatments do not help. Spironolactone, a mild diuretic (water tablet) has anti-androgen properties and is usually well tolerated.

Drugs taken by mouth to treat hair growth take 3-9 months to work fully. You need then to carry on taking them otherwise hair growth will recur. Removing hair by the methods above (shaving, etc) may be advised whilst waiting for a drug to work.

Treating acne

The treatments used for acne in women with PCOS are no different to the usual treatments for acne. The combined contraceptive pills, especially Dianette® often help to improve acne.

Treating period problems

Some women who have no periods, or infrequent periods, do not want any treatment for this. However, your risk of developing cancer of the uterus (womb) may be increased if you have no periods for a long time. Regular periods will prevent this possible increased risk to the uterus.

Therefore, some women with PCOS are advised to take the contraceptive pill as it causes regular withdrawal bleeds similar to periods. If this is not suitable, another option is to take progestogen hormone for several days every month which will cause a monthly bleed like a period. Sometimes, an intrauterine system (Mirena IUS), which releases small amounts of progesterone into the womb preventing a build-up of the lining, can be used. If none of these

methods is suitable, your doctor may advise a regular ultrasound scan of your uterus to detect any problems early.

Fertility issues

Although fertility is often reduced, you still need contraception if you want to be sure of not getting pregnant. The chance of becoming pregnant depends on how often you ovulate. Some women with PCOS ovulate now and then, others not at all.

If you do not ovulate but want to become pregnant, then fertility treatments may be recommended by a specialist and have a good chance of success. But remember, you are much less likely to become pregnant if you are obese. If you are obese or overweight then losing weight is advised in addition to other fertility treatments.

Metformin and other insulin-sensitising drugs

Metformin is a drug that is commonly used to treat people with type 2 diabetes. It makes the body's cells more sensitive to insulin. This may result in a decrease in the blood level of insulin which may help to counteract the underlying cause of PCOS - see above. Other newer insulin-sensitising drugs include rosiglitazone, pioglitazone and D-chiro-inositol. For certain people with PCOS, a specialist may advise that you take metformin or another insulin-sensitising drug. However, further research is needed to confirm the role of these drugs in the treatment of PCOS. If you are overweight then Metformin does not cause weight loss for which there is no replacement to exercise and dieting.

Preventing long-term problems

A healthy lifestyle is important to help prevent the conditions listed above in 'Possible long-term problems of polycystic ovary syndrome'. For example, you should: eat a healthy diet, exercise regularly, lose weight if you are overweight or obese, and not smoke.