

Polycystic Ovary Syndrome (PCOS): Symptoms, Causes, and Treatment



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Polycystic ovary syndrome is caused by an imbalance of androgens. Common symptoms include ovarian cysts, irregular menstrual periods, and hair on the face and body. Treatment options include hormonal birth control and the diabetes drug metformin.

Polycystic ovary syndrome (PCOS) is a condition that affects a woman's hormone levels.

Women with PCOS produce higher-than-normal amounts of male hormones. This hormone imbalance causes their body to skip menstrual periods and makes it harder for them to get pregnant.

PCOS also causes hair growth on the face and body, and baldness. And it can contribute to long-term health problems like [diabetes](#) and [heart disease](#).

Birth control pills and diabetes drugs (which combat insulin resistance, a PCOS symptom) can help fix the hormone imbalance and improve

symptoms.

Read on for a look at the possible causes of PCOS and its possible effects on a woman's body.


Polycystic Ovary Syndrome


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What is PCOS?

PCOS is a problem with hormones that affects women during their childbearing years (ages 15 to 44). Between 2.2 and 26.7 percent of women in this age group have PCOS (1, 2 )

Many women have PCOS but don't know it. In one study, up to 70 percent of women with PCOS hadn't been diagnosed (2 )

PCOS affects a woman's ovaries, the reproductive organs that produce estrogen and progesterone — hormones that regulate the menstrual cycle. The ovaries also produce a small amount of male hormones called androgens.

The ovaries release eggs to be fertilized by a man's sperm. The release of an egg each month is called ovulation.

Follicle-stimulating hormone (FSH) and luteinizing hormone (LH), which are produced in the pituitary gland, control ovulation.

FSH stimulates the ovary to produce a follicle — a sac that contains an egg — and then LH triggers the ovary to release a mature egg.

PCOS is a “syndrome,” or group of symptoms that affects the ovaries and ovulation. Its three main features are:


- cysts in the ovaries
- high levels of male hormones
- irregular or skipped periods

In PCOS, many small, fluid-filled sacs grow inside the ovaries. The word “polycystic” means “many cysts.”

These sacs are actually follicles, each one containing an immature egg. The eggs never mature enough to trigger ovulation.

The lack of ovulation alters levels of estrogen, progesterone, FSH, and LH. Progesterone levels are lower than usual, while androgen levels are higher than usual.

Extra male hormones disrupt the menstrual cycle, so women with PCOS get fewer periods than usual.

PCOS isn't a new condition. Italian physician Antonio Vallisneri first described its symptoms in 1721 (3 )

SUMMARY

Polycystic ovary syndrome (PCOS) affects up to almost 27 percent of women during their childbearing years (4). It involves cysts in the ovaries, high levels of male hormones, and irregular periods.

What causes it?

Doctors don't know exactly what causes PCOS. They believe that high levels of male hormones prevent the ovaries from producing hormones and making eggs normally.


Genes, insulin resistance, and inflammation have all been linked to excess androgen production.

Genes

Studies show that PCOS runs in families (5).


It's likely that many genes — not just one — contribute to the condition (6).

Insulin resistance


Up to 70 percent of women with PCOS have [insulin resistance](#), meaning that their cells can't use insulin properly (7 )

Insulin is a hormone the pancreas produces to help the body use sugar from foods for energy.

When cells can't use insulin properly, the body's demand for insulin increases. The pancreas makes more insulin to compensate. Extra insulin triggers the ovaries to produce more male hormones.

Obesity is a major cause of insulin resistance. Both obesity and insulin resistance can increase your risk for **type 2 diabetes** (8 .

Inflammation

Women with PCOS often have increased levels of inflammation in their body. Being overweight can also contribute to inflammation. Studies have linked excess inflammation to higher androgen levels (9 .

SUMMARY


Doctors don't know exactly what causes PCOS. They believe it stems from factors such as genes, insulin resistance, and higher levels of inflammation in the body.

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Common symptoms of PCOS

Some women start seeing symptoms around the time of their first period. Others only discover they have PCOS after they've gained a lot of weight or they've had trouble getting pregnant.

The most common PCOS symptoms are:

- **Irregular periods.** A lack of ovulation prevents the uterine lining from shedding every month. Some women with PCOS get fewer than eight periods a year or none at all (10 )
- **Heavy bleeding.** The uterine lining builds up for a longer period of time, so the periods you do get can be heavier than normal.
- **Hair growth.** More than 70 percent of women with this condition grow hair on their face and body — including on their back, belly, and chest (11). **Excess hair growth** is called hirsutism.
- **Acne.** Male hormones can make the skin oilier than usual and cause breakouts on areas like the face, chest, and upper back.
- **Weight gain.** Up to 80 percent of women with PCOS are overweight or have obesity (11).
- **Male pattern baldness.** Hair on the scalp gets thinner and may fall out.
- **Darkening of the skin.** Dark **patches** of skin can form in body creases like those on the neck, in the groin, and under the breasts.
- **Headaches.** Hormone changes can trigger **headaches** in some women.

SUMMARY

PCOS can disrupt the menstrual cycle, leading to fewer periods. Acne, hair growth, weight gain, and dark skin patches are other symptoms of the condition.


How PCOS affects your body

Having higher-than-normal androgen levels can affect your fertility and other aspects of your health.

Infertility

To get pregnant, you have to ovulate. Women who don't ovulate regularly don't release as many eggs to be fertilized. PCOS is one of the leading causes of [infertility](#) in women (12).

Metabolic syndrome

Up to 80 percent of women with PCOS are overweight or have obesity (13 ). Both obesity and PCOS increase your risk for:

- high blood sugar
- [high blood pressure](#)
- low HDL “good” cholesterol
- high LDL “bad” cholesterol

Together, these factors are called [metabolic syndrome](#), and they increase the risk for:

- heart disease
- diabetes
- stroke

Sleep apnea

This condition causes repeated pauses in breathing during the night, which interrupt sleep.

Sleep apnea is more common in women who are overweight — especially if they also have PCOS. The risk for sleep apnea is 5 to 10 times higher in women who have both obesity and PCOS than in those without PCOS (14).

Endometrial cancer

During ovulation, the uterine lining sheds. If you don't ovulate every month, the lining can build up.

A thickened uterine lining can increase your risk for endometrial cancer (15).

Depression

Both hormonal changes and symptoms like unwanted hair growth can negatively affect your emotions. Many with PCOS eventually experience depression and anxiety (16).



SUMMARY

Hormone imbalances can affect a woman's health in many ways. PCOS can increase the risk of infertility, metabolic syndrome, sleep apnea, endometrial cancer, and depression.

How PCOS is diagnosed

Doctors typically diagnose PCOS in women who have at least two of these three symptoms (17[✓]):

- high androgen levels
- irregular menstrual cycles
- cysts in the ovaries

Your doctor should also ask whether you've had symptoms like acne, face and body hair growth, and weight gain.

A [pelvic exam](#) can look for any problems with your ovaries or other parts of your reproductive tract. During this test, your doctor inserts gloved fingers into your vagina and checks for any growths in your ovaries or uterus.

Blood tests check for higher-than-normal levels of male hormones.


You might also have blood tests to check your [cholesterol](#), insulin, and [triglyceride levels](#) to evaluate your risk for related conditions like heart disease and diabetes.

An [ultrasound](#) uses sound waves to look for abnormal follicles and other problems with your ovaries and uterus.

SUMMARY

Doctors diagnose PCOS if women have at least two of three main symptoms — high androgen levels, irregular periods, and cysts in the ovaries. A pelvic exam, blood tests, and ultrasound can confirm the diagnosis.

Pregnancy and PCOS

PCOS interrupts the normal menstrual cycle and makes it harder to get pregnant. Between 70 and 80 percent of women with PCOS have fertility problems (18 )

This condition can also increase the risk for [pregnancy complications](#).

Women with PCOS are twice as likely as women without the condition to deliver their baby prematurely. They're also at greater risk for miscarriage, high blood pressure, and [gestational diabetes](#) (19).

However, women with PCOS can get pregnant using [fertility treatments](#) that improve ovulation. Losing weight and lowering blood sugar levels can improve your chances of having a healthy pregnancy.

SUMMARY

PCOS can make it harder to get pregnant and increase your risk for pregnancy complications and miscarriage. Weight loss and other treatments can improve your chances of having a healthy pregnancy.

Diet and lifestyle tips to treat PCOS

Treatment for PCOS usually starts with lifestyle changes like weight loss, diet, and exercise.

Losing just 5 to 10 percent of your body weight can help regulate your menstrual cycle and improve PCOS symptoms (11, 20[✓]). Weight loss can also:

- improve cholesterol levels
- lower insulin
- reduce heart disease and diabetes risks

Any diet that helps you lose weight can help your condition. However, some diets may have advantages over others.

Studies comparing diets for PCOS have found that low carbohydrate diets are effective for both weight loss and lowering insulin levels.


A low glycemic index (low GI) diet that gets most carbohydrates from fruits, vegetables, and whole grains helps regulate the menstrual cycle better than a regular weight loss diet (21).

A few studies have found that 30 minutes of moderate-intensity exercise at least 3 days a week can help women with PCOS lose weight. Losing weight with exercise also improves ovulation and insulin levels (22).

Exercise is even more beneficial when combined with a healthy diet. Diet plus exercise helps you lose more weight than either intervention alone, and it lowers your risks for diabetes and heart disease (23[✓]).

There is some evidence that acupuncture can help with improving PCOS, but more research is needed (24[✓]).

SUMMARY



PCOS treatment starts with lifestyle changes like diet and exercise. Losing just 5 to 10 percent of your body weight if you're overweight can help improve your symptoms.

Common medical treatments

Birth control pills and other medications can help regulate the menstrual cycle and treat PCOS symptoms like hair growth and acne.

Birth control

Taking progestin daily can:

- restore a normal hormone balance
- regulate ovulation
- relieve symptoms like excess hair growth
- protect against endometrial cancer

These hormones come in a [pill](#), [patch](#), or [vaginal ring](#).

Metformin

[Metformin](#) (Glucophage, Fortamet) is a drug used to treat type 2 diabetes. It also treats PCOS by improving insulin levels.

One study found that taking [metformin](#) while making changes to diet and exercise improves weight loss, lowers blood sugar, and restores a normal menstrual cycle better than changes to diet and exercise alone ([25](#)).

Clomiphene

Clomiphene (Clomid) is a [fertility drug](#) that can help women with PCOS get pregnant.

It's important to note that, as you're discussing family planning, to keep in mind that clomiphene increases the chances for twins and other multiple births (26).

Hair removal medications

A few treatments can help get rid of unwanted hair or stop it from growing.

Eflornithine (Vaniqa) cream is a prescription drug that slows hair growth. [Laser hair removal](#) and [electrolysis](#) can get rid of unwanted hair on your face and body.

Surgery

Surgery can be an option to improve fertility if other treatments don't work. Ovarian drilling is a procedure that makes tiny holes in the ovary with a laser or thin heated needle to restore normal ovulation.

SUMMARY

Birth control pills and the diabetes drug metformin can help bring back a normal menstrual cycle. Clomiphene and surgery improve fertility in women with PCOS. Hair removal medications can help women remove unwanted hair.

When to see a doctor

See your doctor if:

- You've missed periods, and you're not pregnant.
- You have symptoms of PCOS, such as hair growth on your face and body.
- You've been trying to get pregnant for more than 12 months but haven't been successful.
- You have symptoms of diabetes, such as excess thirst or hunger, blurred vision, or unexplained weight loss.

If your periods are already irregular or absent and you're trying to get pregnant, do not wait 12 months to see a specialist to be evaluated (27).

Also, keep in mind that if you do not wish to get pregnant, irregular or absent periods are not birth control in themselves.


It may still be possible to get pregnant even under these conditions. It's best to use contraception in this case even if you have PCOS.

If you have PCOS, plan regular visits with your primary care doctor. You'll need regular tests to check for diabetes, high blood pressure, and other possible complications.

If you don't already have an obgyn, you can browse doctors in your area through the [Healthline FindCare tool](#).



SUMMARY



See your doctor if your body has skipped periods, or you have other PCOS symptoms like hair growth on your face or body. Also see a doctor if you've been trying to get pregnant for 12 months or more without success.

The bottom line

PCOS can disrupt a woman's menstrual cycles and make it harder to get pregnant. High levels of male hormones also lead to unwanted symptoms like hair growth on the face and body.

Lifestyle interventions are the first treatments doctors recommend for PCOS, and they often work well.

Weight loss can treat PCOS symptoms and improve the odds of getting pregnant. Diet and aerobic exercise are two effective ways to lose weight.

Medications are an option if lifestyle changes don't work. Birth control pills and metformin can both restore more normal menstrual cycles and relieve PCOS symptoms.

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