



Polycystic Ovary Syndrome (PCOS)

<http://www.womenshealth.gov>

1-800-994-9662

TDD: 1-888-220-5446

Q: What is polycystic ovary syndrome (PCOS)?

A: Polycystic (pah-lee-SIS-tik) ovary syndrome (PCOS) is a health problem that can affect a woman's:

- Menstrual cycle
- Ability to have children
- Hormones
- Heart
- Blood vessels
- Appearance

With PCOS, women typically have:

- High levels of androgens (AN-druh-junz). These are sometimes called male hormones, though females also make them.
- Missed or irregular periods (monthly bleeding)
- Many small cysts (sists) (fluid-filled sacs) in their ovaries

Q: How many women have PCOS?

A: Between 1 in 10 and 1 in 20 women of childbearing age has PCOS. As many as 5 million women in the United States may be affected. It can occur in girls as young as 11 years old.

Q: What causes PCOS?

A: The cause of PCOS is unknown. But most experts think that several factors, including genetics, could play a role. Women with PCOS are more likely to have a mother or sister with PCOS.

A main underlying problem with PCOS is a hormonal imbalance. In women with PCOS, the ovaries make more androgens than normal. Androgens are male hormones that females also make. High levels of these hormones affect the development and release of eggs during ovulation.

Researchers also think insulin may be linked to PCOS. Insulin is a hormone that controls the change of sugar, starches, and other food into energy for the body to use or store. Many women with PCOS have too much insulin in their bodies because they have problems using it. Excess insulin appears to increase production of androgen. High androgen levels can lead to:

- Acne
- Excessive hair growth
- Weight gain
- Problems with ovulation

Q: What are the symptoms of PCOS?

A: The symptoms of PCOS can vary from woman to woman. Some of the symptoms of PCOS include:

- Infertility (not able to get pregnant) because of not ovulating. In fact, PCOS is the most common cause of female infertility.
- Infrequent, absent, and/or irregular menstrual periods
- Hirsutism (HER-suh-tiz-um) — increased hair growth on the face, chest, stomach, back, thumbs, or toes



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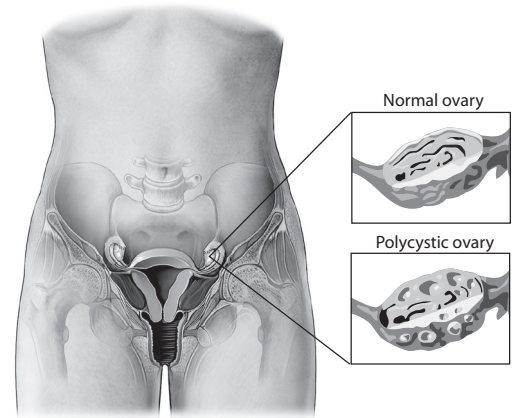
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- Cysts on the ovaries
- Acne, oily skin, or dandruff
- Weight gain or obesity, usually with extra weight around the waist
- Male-pattern baldness or thinning hair
- Patches of skin on the neck, arms, breasts, or thighs that are thick and dark brown or black
- Skin tags — excess flaps of skin in the armpits or neck area
- Pelvic pain
- Anxiety or depression
- Sleep apnea — when breathing stops for short periods of time while asleep

Q: Why do women with PCOS have trouble with their menstrual cycle and fertility?

A: The ovaries, where a woman's eggs are produced, have tiny fluid-filled sacs called follicles or cysts. As the egg grows, the follicle builds up fluid. When the egg matures, the follicle breaks open, the egg is released, and the egg travels through the fallopian tube to the uterus (womb) for fertilization. This is called ovulation.

In women with PCOS, the ovary doesn't make all of the hormones it needs for an egg to fully mature. The follicles may start to grow and build up fluid but ovulation does not occur. Instead, some follicles may remain as cysts. For these reasons, ovulation does not occur and the hormone progesterone is not made. Without progesterone, a woman's menstrual cycle is irregular or absent. Plus, the ovaries make male hormones, which also prevent ovulation.



Q: Does PCOS change at menopause?

A: Yes and no. PCOS affects many systems in the body. So, many symptoms may persist even though ovarian function and hormone levels change as a woman nears menopause. For instance, excessive hair growth continues, and male-pattern baldness or thinning hair gets worse after menopause. Also, the risks of complications (health problems) from PCOS, such as heart attack, stroke, and diabetes, increase as a woman gets older.

Q: How do I know if I have PCOS?

A: There is no single test to diagnose PCOS. Your doctor will take the following steps to find out if you have PCOS or if something else is causing your symptoms.

Medical History. Your doctor will ask about your menstrual periods, weight changes, and other symptoms.

Physical Exam. Your doctor will want to measure your blood pressure, body mass index (BMI), and waist size. He or she also will check the areas of increased hair growth. You should try to allow the natural hair to grow for a few days before the visit.



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Pelvic Exam. Your doctor might want to check to see if your ovaries are enlarged or swollen by the increased number of small cysts.

Blood Tests. Your doctor may check the androgen hormone and glucose (sugar) levels in your blood.

Vaginal Ultrasound (sonogram). Your doctor may perform a test that uses sound waves to take pictures of the pelvic area. It might be used to examine your ovaries for cysts and check the endometrium (en-do-MEE-tree-uhm) (lining of the womb). This lining may become thicker if your periods are not regular.

Q: How is PCOS treated?

A: Because there is no cure for PCOS, it needs to be managed to prevent problems. Treatment goals are based on your symptoms, whether or not you want to become pregnant, and lowering your chances of getting heart disease and diabetes. Many women will need a combination of treatments to meet these goals. Some treatments for PCOS include:

Lifestyle modification. Many women with PCOS are overweight or obese, which can cause health problems. You can help manage your PCOS by eating healthy and exercising to keep your weight at a healthy level. Healthy eating tips include:

- Limiting processed foods and foods with added sugars
- Adding more whole-grain products, fruits, vegetables, and lean meats to your diet

This helps to lower blood glucose (sugar) levels, improve the body's use of insulin, and normalize hormone levels in your body. Even a 10 percent loss in

body weight can restore a normal period and make your cycle more regular.

Birth control pills. For women who don't want to get pregnant, birth control pills can:

- Control menstrual cycles
- Reduce male hormone levels
- Help to clear acne

Keep in mind that the menstrual cycle will become abnormal again if the pill is stopped. Women may also think about taking a pill that only has progesterone (proh-JES-tuh-rohn), like Provera, to control the menstrual cycle and reduce the risk of endometrial cancer (See "Does PCOS put women at risk for other health problems?"). But, progesterone alone does not help reduce acne and hair growth.

Diabetes medications. The medicine metformin (Glucophage) is used to treat type 2 diabetes. It has also been found to help with PCOS symptoms, though it isn't approved by the U.S. Food and Drug Administration (FDA) for this use. Metformin affects the way insulin controls blood glucose (sugar) and lowers testosterone production. It slows the growth of abnormal hair and, after a few months of use, may help ovulation to return. Recent research has shown metformin to have other positive effects, such as decreased body mass and improved cholesterol levels. Metformin will not cause a person to become diabetic.

Fertility medications. Lack of ovulation is usually the reason for fertility problems in women with PCOS. Several medications that stimulate ovulation can help women with PCOS become pregnant. Even so, other reasons for infertility in both the woman and man should be ruled out before



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fertility medications are used. Also, some fertility medications increase the risk for multiple births (twins, triplets). Treatment options include:

- Clomiphene (KLOHM-uh-feen) (Clomid, Serophene) — the first choice therapy to stimulate ovulation for most patients.
- Metformin taken with clomiphene — may be tried if clomiphene alone fails. The combination may help women with PCOS ovulate on lower doses of medication.
- Gonadotropins (goe-NAD-oh-troe-pins) — given as shots, but are more expensive and raise the risk of multiple births compared to clomiphene.

Another option is in vitro fertilization (IVF). IVF offers the best chance of becoming pregnant in any given cycle. It also gives doctors better control over the chance of multiple births. But, IVF is very costly.

Surgery. "Ovarian drilling" is a surgery that may increase the chance of ovulation. It's sometimes used when a woman does not respond to fertility medicines. The doctor makes a very small cut above or below the navel (belly button) and inserts a small tool that acts like a telescope into the abdomen (stomach). This is called laparoscopy (lap-uh-RAHS-kuh-pee). The doctor then punctures the ovary with a small needle carrying an electric current to destroy a small portion of the ovary. This procedure carries a risk of developing scar tissue on the ovary. This surgery can lower male hormone levels and help with ovulation. But, these effects may only last a few months. This treatment doesn't help with loss of scalp hair or increased hair growth on other parts of the body.

Medicine for increased hair growth or extra male hormones. Medicines called anti-androgens may reduce hair growth and clear acne. Spironolactone (speer-on-oh-LAK-tone) (Aldactone), first used to treat high blood pressure, has been shown to reduce the impact of male hormones on hair growth in women. Finasteride (fin-AST-uh-yr-d) (Propecia), a medicine taken by men for hair loss, has the same effect. Anti-androgens are often combined with birth control pills. These medications should not be taken if you are trying to become pregnant.

Before taking Aldactone, tell your doctor if you are pregnant or plan to become pregnant. Do not breastfeed while taking this medicine. Women who may become pregnant should not handle Propecia.

Other options include:

- Vaniqa (van-ik-uh) cream to reduce facial hair
- Laser hair removal or electrolysis to remove hair
- Hormonal treatment to keep new hair from growing

Other Treatments. Some research has shown that bariatric (weight loss) surgery may be effective in resolving PCOS in morbidly obese women. Morbid obesity means having a BMI of more than 40, or a BMI of 35 to 40 with an obesity-related disease. The drug troglitazone (troh-GLIT-uh-zohn) was shown to help women with PCOS. But, it was taken off the market because it caused liver problems. Similar drugs without the same side effect are being tested in small trials.



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Researchers continue to search for new ways to treat PCOS. To learn more about current PCOS treatment studies, visit the clinicaltrials.gov Web site. Talk to your doctor about whether taking part in a clinical trial might be right for you.

Q: How does PCOS affect a woman while pregnant?

A: Women with PCOS appear to have higher rates of:

- Miscarriage
- Gestational diabetes
- Pregnancy-induced high blood pressure (preeclampsia)
- Premature delivery

Babies born to women with PCOS have a higher risk of spending time in a neonatal intensive care unit or of dying before, during, or shortly after birth. Most of the time, these problems occur in multiple-birth babies (twins, triplets).

Researchers are studying whether the diabetes medicine metformin can prevent or reduce the chances of having problems while pregnant. Metformin also lowers male hormone levels and limits weight gain in women who are obese when they get pregnant.

Metformin is an FDA pregnancy category B drug. It does not appear to cause major birth defects or other problems in pregnant women. But, there have only been a few studies of metformin use in pregnant women to confirm its safety. Talk to your doctor about taking metformin if you are pregnant or are trying to become pregnant. Also, metformin is passed through breastmilk. Talk with your doctor about metformin use if you are a nursing mother.

Q: Does PCOS put women at risk for other health problems?

A: Women with PCOS have greater chances of developing several serious health conditions, including life-threatening diseases. Recent studies found that:

- More than 50 percent of women with PCOS will have diabetes or pre-diabetes (impaired glucose tolerance) before the age of 40.
- The risk of heart attack is 4 to 7 times higher in women with PCOS than women of the same age without PCOS.
- Women with PCOS are at greater risk of having high blood pressure.
- Women with PCOS have high levels of LDL (bad) cholesterol and low levels of HDL (good) cholesterol.
- Women with PCOS can develop sleep apnea. This is when breathing stops for short periods of time during sleep.

Women with PCOS may also develop anxiety and depression. It is important to talk to your doctor about treatment for these mental health conditions.

Women with PCOS are also at risk for endometrial cancer. Irregular menstrual periods and the lack of ovulation cause women to produce the hormone estrogen, but not the hormone progesterone. Progesterone causes the endometrium (lining of the womb) to shed each month as a menstrual period. Without progesterone, the endometrium becomes thick, which can cause heavy or irregular bleeding. Over time, this can lead to endometrial hyperplasia, when the lining grows too much, and cancer.



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Q: I have PCOS. What can I do to prevent complications?

A: If you have PCOS, get your symptoms under control at an earlier age to help reduce your chances of having complications like diabetes and heart disease. Talk to your doctor about treating all your symptoms, rather than focusing on just one aspect of your PCOS, such as problems getting pregnant. Also, talk to your doctor about getting tested for diabetes regularly. Other steps you can take to lower your chances of health problems include:

- Eating right
- Exercising
- Not smoking

Q: How can I cope with the emotional effects of PCOS?

A: Having PCOS can be difficult. You may feel:

- Embarrassed by your appearance
- Worried about being able to get pregnant
- Depressed

Getting treatment for PCOS can help with these concerns and help boost your self-esteem. You may also want to look for support groups in your area or online to help you deal with the emotional effects of PCOS. You are not alone and there are resources available for women with PCOS. ■



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For more information

You can find out more about PCOS by contacting womenshealth.gov at 1-800-994-9662 or the following organizations:

Women's Health Research, National Institute of Child Health and Human Development (NICHD), NIH, HHS

Phone: (800) 370-2943

Internet Address: <http://www.nichd.nih.gov/womenshealth>

American Association of Clinical Endocrinologists (AACE)

Phone: (904) 353-7878

Internet Address: <http://www.aace.com>

American College of Obstetricians and Gynecologists

Phone: (202) 638-5577

Internet Address: <http://www.acog.org>

American Society for Reproductive Medicine (ASRM)

Phone: (205) 978-5000

Internet Address: <http://www.asrm.org>

Center for Applied Reproductive Science (CARS)

Phone: (423) 461-8880

Internet Address: <http://www.ivf-et.com>

InterNational Council on Infertility Information Dissemination, Inc. (INCIID)

Phone: (703) 379-9178

Internet Address: <http://www.inciid.org>

Polycystic Ovarian Syndrome Association, Inc. (PCOSA)

Internet Address: <http://www.pcosupport.org>

The Hormone Foundation

Phone: (800) 467-6663

Internet Address: <http://www.hormone.org>

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Content last updated March 17, 2010.