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# Polycystic Ovary Syndrome (PCOS)

**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, and appearance. With PCOS, women typically have:

- high levels of androgens (AN-druh-junz). These are sometimes called male hormones, although females also make them.
- missed or irregular periods
- many small cysts (sists) in their ovaries. Cysts are fluid-filled sacs.

**Q: How many women have polycystic ovary syndrome (PCOS)?**

**A:** About one in ten women of childbearing age has PCOS. It can occur in girls as young as 11 years old. PCOS is the most common cause of female infertility (not being able to get pregnant).

**Q: What causes polycystic ovary syndrome (PCOS)?**

**A:** The cause of PCOS is unknown. Most researchers think that more than one

factor could play a role in developing PCOS. Genes are thought to be one factor. Women with PCOS tend to have a mother or sister with PCOS. Researchers also think insulin could 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. For many women with PCOS, their bodies have problems using insulin so that too much insulin is in the body. Excess insulin appears to increase production of androgen. This hormone is made in fat cells, the ovaries, and the adrenal gland. Levels of androgen that are higher than normal can lead to acne, excessive hair growth, weight gain, and problems with ovulation.

**Q: Does polycystic ovary syndrome (PCOS) run in families?**

**A:** Most researchers think that PCOS runs in families. Women with PCOS tend to have a mother or sister with PCOS. Still, there is no proof that PCOS is inherited.

**Q: What are the symptoms of polycystic ovary syndrome (PCOS)?**

**A:** Not all women with PCOS share the same symptoms. These are some of the symptoms of PCOS:

- infrequent menstrual periods, no menstrual periods, and/or irregular bleeding
- infertility (not able to get pregnant) because of not ovulating
- increased hair growth on the face, chest, stomach, back, thumbs, or toes—a condition called hirsutism (HER-suh-tiz-um)



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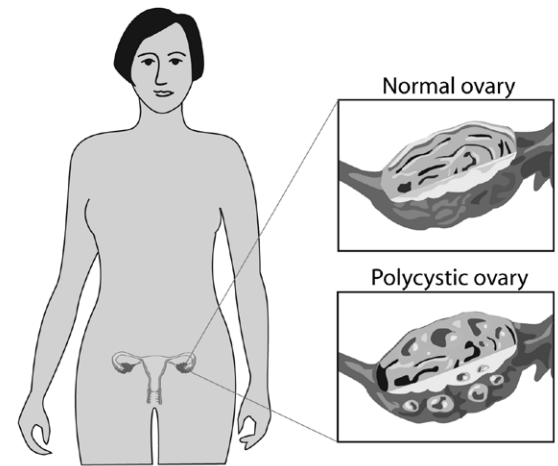
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- ovarian cysts
- acne, oily skin, or dandruff
- weight gain or obesity, usually carrying extra weight around the waist
- insulin resistance or type 2 diabetes
- high cholesterol
- high blood pressure
- male-pattern baldness or thinning hair
- patches of thickened and dark brown or black skin on the neck, arms, breasts, or thighs
- skin tags, or tiny excess flaps of skin in the armpits or neck area
- pelvic pain
- anxiety or depression due to appearance and/or infertility
- sleep apnea—excessive snoring and times when breathing stops while asleep

**Q: Why do women with polycystic ovary syndrome (PCOS) have trouble with their menstrual cycle?**

The ovaries are two small organs, one on each side of a woman's uterus. A woman's ovaries have follicles, which are tiny sacs filled with liquid that hold the eggs. These sacs also are called cysts. Each month about 20 eggs start to mature, but usually only one matures fully. As this one egg grows, the follicle accumulates fluid in it. When that egg matures, the follicle breaks open to release it. The egg then travels through the fallopian tube for fertilization. When the single egg leaves the follicle, ovulation takes place.



In women with PCOS, the ovary doesn't make all of the hormones it needs for any of the eggs to fully mature. Follicles may start to grow and build up fluid. But no one follicle becomes large enough. Instead, some follicles may remain as cysts. Since no follicle becomes large enough and no egg matures or is released, ovulation does not occur and the hormone progesterone is not made. Without progesterone, a woman's menstrual cycle is irregular or absent. Plus, the cysts make male hormones, which also prevent ovulation.

**Q: Does polycystic ovary syndrome (PCOS) change at menopause?**

**A:** Yes and no. Because PCOS affects many systems in the body, many symptoms 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 from PCOS, such as heart attack, stroke and diabetes, increase as a woman gets older.



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**Q: What tests are used to diagnose polycystic ovary syndrome (PCOS)?**

**A:** There is no single test to diagnose PCOS. Your doctor will take a medical history, perform a physical exam, and possibly take some tests to rule out other causes of your symptoms. During the physical exam the doctor will want to measure your blood pressure, body mass index (BMI), and waist size. He or she also will check out the areas of increased hair growth, so try to allow the natural hair growth for a few days before the visit. Your doctor might want to do a pelvic exam to see if your ovaries are enlarged or swollen by the increased number of small cysts. A vaginal ultrasound also might be used to examine the ovaries for cysts and check out the endometrium, the lining of the uterus. The uterine lining may become thicker if your periods are not regular. You also might have blood taken to check your hormone levels and to measure glucose (sugar) levels.

**Q: How is polycystic ovary syndrome (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:

**Birth control pills.** For women who don't want to become pregnant, birth control pills can control menstrual cycles, reduce male hormone levels, and help to clear acne. However, the

menstrual cycle will become abnormal again if the pill is stopped. Women may also think about taking a pill that only has progesterone, like Provera®, to control the menstrual cycle and reduce the risk of endometrial cancer. (See *Does polycystic ovary syndrome (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 also has been found to help with PCOS symptoms, although it is not FDA-approved for this use. Metformin affects the way insulin controls blood glucose (sugar) and lowers testosterone production. Abnormal hair growth will slow down, and ovulation may return after a few months of use. 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 fertility medications are used. Also, there is an increased risk for multiple births (twins, triplets) with fertility medications. For most patients, clomiphene citrate (Clomid®, Serophene®) is the first choice therapy to stimulate ovulation. If this fails, metformin taken with clomiphene is usually tried. When metformin is taken along with fertility medications, it may help women with



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PCOS ovulate on lower doses of medication. Gonadotropins (goe-NAD-oh-troe-pins) also can be used to stimulate ovulation. These are given as shots. But gonadotropins are more expensive and there are greater chances of multiple births compared to clomiphene. Another option is in vitro fertilization (IVF). IVF offers the best chance of becoming pregnant in any one cycle and gives doctors better control over the chance of multiple births. But, IVF is very costly.

**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 (Propecia®), a medicine taken by men for hair loss, has the same effect. Anti-androgens often are combined with oral contraceptives.

***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®.***

Vaniqa® cream also reduces facial hair in some women. Other treatments such as laser hair removal or electrolysis work well at getting rid of hair in some women. A woman with PCOS can also take hormonal treatment to keep new hair from growing.

**Surgery.** “Ovarian drilling” is a surgery that brings on ovulation. It is sometimes used when a woman does not respond to fertility medicines. The doctor makes a very small cut above

or below the navel and inserts a small tool that acts like a telescope into the abdomen. This is called laparoscopy. 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 and increased hair growth on other parts of the body.

**Lifestyle modification.** Keeping a healthy weight by eating healthy foods and exercising is another way women can help manage PCOS. Many women with PCOS are overweight or obese. Eat fewer processed foods and foods with added sugars and more whole-grain products, fruits, vegetables, and lean meats to help lower blood sugar (glucose) 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 a woman's cycle more regular.

**Q: How does polycystic ovary syndrome (PCOS) affect a woman while pregnant?**

**A:** There appears to be higher rates of miscarriage, gestational diabetes, pregnancy-induced high blood pressure (pre-eclampsia), and premature delivery in women with PCOS. Researchers are studying how the diabetes medicine metformin can prevent or reduce the chances of having these problems while pregnant. Metformin also lowers male hormone levels and limits weight gain in women who are obese when they get



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pregnant.

Metformin is a FDA pregnancy category B drug. It does not appear to cause major birth defects or other problems in pregnant women. But, there have been no studies of metformin on pregnant women to confirm its safety. Talk to your doctor about taking metformin during pregnancy or if you are trying to become pregnant. Also, metformin is passed through milk in breastfeeding mothers. Talk with your doctor about metformin use if you are a nursing mother.

**Q: Does polycystic ovary syndrome (PCOS) put women at risk for other health problems?**

**A:** Women with PCOS have greater chances of developing several serious, life-threatening diseases, including type 2 diabetes, cardiovascular disease (CVD), and cancer. 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.
- Women with PCOS have a four to seven times higher risk of heart attack 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.

The chance of getting endometrial cancer is another concern for women with PCOS. Irregular menstrual periods and the absence of ovulation cause women to produce the hormone estrogen, but not the hormone progesterone. Progesterone causes the endometrium to shed its lining each month as a menstrual period. Without progesterone, the endometrium becomes thick, which can cause heavy bleeding or irregular bleeding. Over time, this can lead to endometrial hyperplasia, when the lining grows too much, and cancer.

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

**A:** Getting your symptoms under control at an earlier age can help to 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 our doctor about getting tested for diabetes regularly. Eating right, exercising, and not smoking also will help to reduce your chances of having other health problems.

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

**A:** Having PCOS can be difficult. Many women are embarrassed by their appearance. Others may worry about being able to get pregnant. Some women with PCOS might get depressed. Getting treatment for PCOS can help with these concerns and help boost a woman's self-esteem. Support groups located across the United States and on-line also can help women with PCOS deal with the emotional affects.



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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:

**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 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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