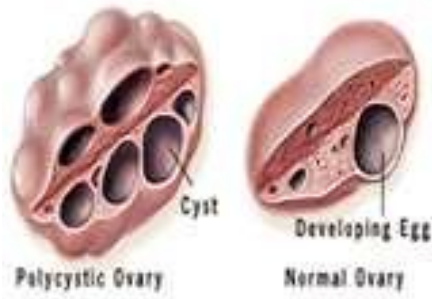


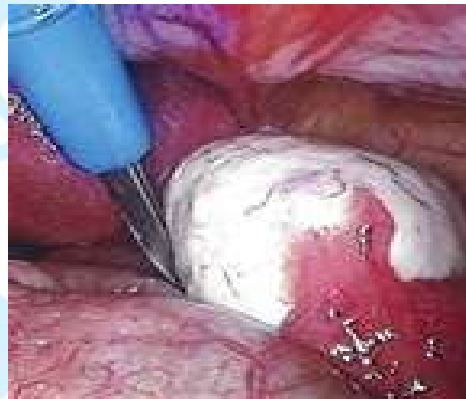
## POLYCYSTIC OVARY SYNDROME (PCOS)

### What is PCOS?



Polycystic ovary syndrome (PCOS) is a common endocrine and hormonal disorder among women of reproductive age. The name of the condition comes from the appearance of the ovaries in most, but not all, women with the disorder — enlarged and containing numerous small cysts located along the outer edge of each ovary (polycystic appearance). Studies shows about 1 in 10-15 women (5-6%) women in reproductive age are affected by PCOS.

### Laparoscopic appearance of normal ovary and polycytic ovary



PCOS can cause abnormal menstruation (infrequent or prolonged menstrual periods), excess hair growth, acne, obesity and infertility. The symptom can manifest at any reproductive age but may begin at adolescence age soon after menarche. In women past adolescence, difficulty becoming pregnant or unexplained weight gain may be the first sign.

The exact cause of polycystic ovary syndrome is unknown. Early diagnosis and treatment may reduce the risk of long-term complications, such as diabetes mellitus and heart disease.

### What are the signs and symptoms of PCOS?

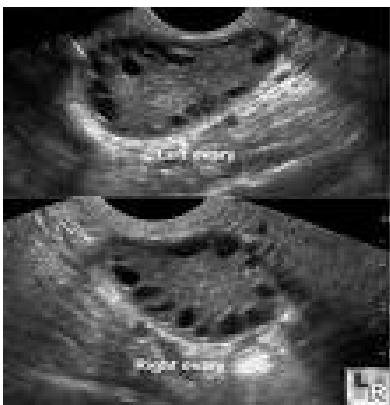
Signs and symptoms vary from person to person, in both type and severity. To be diagnosed with the condition, your doctor looks for at least two of the following:

- **Menstrual abnormality.** This is the most common symptom. Examples of menstrual abnormality include menstrual intervals longer than 35 days; fewer than six menstrual cycles a year; failure to menstruate for four months or longer; and prolonged periods that may be scant or heavy.
- **Excess androgen (male hormones).** Elevated levels of male hormones (androgens) may result in physical signs, such as excess facial and body hair (hirsutism), adult acne or severe adolescent acne, and male-pattern baldness (androgenic alopecia). However, the physical signs of androgen excess vary with ethnicity, so depending on your ethnic background you may or may not show signs of excess androgen.



Oily and acne skin

- **Polycystic ovaries.** Enlarged ovaries containing numerous small cysts can be detected by ultrasound. Despite the condition's name, polycystic ovaries alone do not confirm the diagnosis. To be diagnosed with PCOS, you must also have abnormal menstrual cycles or signs of androgen excess. Some women with polycystic ovaries may not have PCOS, while a few women with the condition have ovaries that appear normal.



Ultrasound image of polycystic ovary

- **Infertility.** A subset of women with PCOS is infertile. Most women with PCOS ovulate intermittently. Conception may take longer than in other women, or women with PCOS may have fewer children than they had planned. In addition, the rate of miscarriage is also higher in affected women
- **Obesity & Metabolic Syndrome.** Nearly half of all women with PCOS are clinically obese. Women with PCOS should be assessed for their cardiovascular risk by evaluating their Body mass Index (BMI), fasting lipid and lipoprotein levels, and risk factors for metabolic syndrome

### **What could be the cause of PCOS?**

Until today the exact cause of polycystic ovary syndrome is not known, but these factors likely play a role:

- **Excess insulin.** Insulin is the hormone produced in the pancreas that allows cells to use sugar (glucose) — your body's primary energy supply. If you have insulin resistance, your ability to use insulin effectively is impaired, and your pancreas has to secrete more insulin to make glucose available to cells. The excess insulin might boost androgen production by your ovaries.
- **Low-grade inflammation.** Your body's white blood cells produce substances to fight infection in a response called inflammation. Eating certain foods can trigger an inflammatory response in some predisposed people. When this happens, white blood cells produce substances that can lead to insulin resistance and cholesterol accumulation in blood vessels (atherosclerosis). Atherosclerosis causes cardiovascular disease. Research has shown that women with PCOS have low-grade inflammation.
- **Heredity.** If your mother or sister has PCOS, you might have a greater chance of having it, too. Researchers also are looking into the possibility that mutated genes are linked to PCOS.
- **Abnormal fetal development.** Some research shows that excessive exposure to male hormones (androgens) in fetal life may permanently prevent normal genes from working the way they're supposed to — a process known as gene expression. This may promote a male pattern of abdominal fat distribution, which increases the risk of insulin resistance and low-grade inflammation. Researchers continue to investigate to what extent these factors might contribute to PCOS

## What are the complications of PCOS if not treated?

Having polycystic ovary syndrome makes the following conditions more likely, especially if obesity also is a factor:

- Type 2 diabetes
- High blood pressure
- Cholesterol and lipid abnormalities, such as elevated triglycerides or low high-density lipoprotein (HDL) cholesterol, the "good" cholesterol
- Elevated levels of C-reactive protein, a cardiovascular disease marker
- Metabolic syndrome, a cluster of signs and symptoms that indicate a significantly increased risk of cardiovascular disease
- Sleep apnea
- Abnormal uterine bleeding
- Cancer of the uterine lining (endometrial cancer), caused by exposure to continuous high levels of estrogen
- Gestational diabetes or pregnancy-induced high blood pressure, if you do become pregnant

## Treatment of PCOS

Polycystic ovary syndrome treatment generally focuses on management of your individual main concerns, such as infertility, hirsutism, acne or obesity.

## Medications

The aim of treatment is to:

- **Regulate your menstrual cycle.** For young ladies and those who are not desiring pregnancy, *low-dose birth control pills* that contain a combination of synthetic estrogen and progesterone are good choice to regulate their monthly period and it is safe for long term use. It decrease androgen production and give your body a break from the effects of continuous estrogen. This decreases your risk of endometrial cancer and corrects abnormal bleeding.

Your doctor also may prescribe *metformin (Glucophage)*, an oral medication for type 2 diabetes that lowers insulin levels. This drug improves ovulation and leads to regular menstrual cycles. Metformin also slows the progression to type 2 diabetes if you already have pre-diabetes and aids in weight loss if you also follow a diet and an exercise program.

- **Help you ovulate.** If you're trying to become pregnant, you may need a medication to help you ovulate. *Clomiphene citrate (Clomid)* is an oral anti-estrogen medication that you take in the first part of your menstrual cycle. If clomiphene citrate alone isn't effective, your doctor may add metformin to help induce ovulation.

If you don't become pregnant using clomiphene and metformin, your doctor may recommend using gonadotropins — follicle-stimulating hormone (FSH) and luteinizing hormone (LH) medications that are administered by injection.

- **Reduce excessive hair growth.** Your doctor may recommend birth control pills to decrease androgen production, or another medication called *spironolactone (Aldactone)* that blocks the effects of androgens on the skin. Because spironolactone can cause birth defects, effective contraception is required when using the drug, and it's not recommended if you're pregnant or planning to become pregnant.

## Surgery

If medications fail to induce ovulation and return of monthly period, a surgical procedure ***ovarian drilling*** is a good option for some women with PCOS. This procedure can be done through open surgery or laparoscopic (key hole) operation. During this procedure, the ovary is drilled using electrical or laser energy on its surface about 2 mm deep for about 10 – 20 holes. As a consequence of the drilling, the tissue tension within the ovary would reduce thus allowing the return of ovarian function, ovulation and return of regular menstruation (if not pregnant).



**Laparoscopic ovarian drilling**

## Lifestyle and home remedies

Paying attention to the foods you eat and your activity levels may help you offset the effects of PCOS:

- **Keep your weight in check.** Obesity makes insulin resistance worse. Weight loss can reduce both insulin and androgen levels, and may restore ovulation. No single specific dietary approach is best, but losing weight by reducing total calorie intake can benefit the overall health of women with polycystic ovary syndrome. Ask your doctor to recommend a weight-control program, and meet regularly with a dietitian for help in reaching weight-loss goals.
- **Consider dietary changes.** Low-fat, high-carbohydrate diets may increase insulin levels, so you may want to consider a low-carbohydrate diet if you have PCOS — and if your doctor recommends it. Don't severely restrict carbohydrates; instead, choose complex carbohydrates, which are high in fiber. The more fiber in a food, the more slowly it's digested and the more slowly your blood sugar levels rise. High-fiber carbohydrates include whole-grain breads and cereals, whole-wheat pasta, bulgur, barley, brown rice, and beans. Limit less healthy, simple carbohydrates such as soda, excess fruit juice, cake, candy, ice cream, pies, cookies and doughnuts.
- **Be active.** Exercise helps lower blood sugar levels. If you have PCOS, increasing your daily activity and participating in a regular exercise program may treat or even prevent insulin resistance and help you keep your weight under control.