Female Infertility

Infertility means that couples have been trying to get pregnant with frequent intercourse for at least a year with no success. Female infertility, male infertility or a combination of the two affects millions of couples in the United States. An estimated 10 to 15 percent of couples have trouble getting pregnant or getting to a successful delivery.

Infertility results from female infertility factors about one-third of the time and male infertility factors about one-third of the time. In the rest, the cause is either unknown or a combination of male and female factors.

The cause of female infertility can be difficult to diagnose, but many treatments are available. Treatment options depend on the underlying problem. Treatment isn't always necessary — many infertile couples will go on to conceive a child spontaneously.

The main symptom of infertility is the inability of a couple to get pregnant. A menstrual cycle that's too long (35 days or more), too short (less than 21 days), irregular or absent can be a sign of lack of ovulation, which can be associated with female infertility. There may be no other outward signs or symptoms.

When to see a doctor

When to seek help depends, in part, on your age.

- **If you're in your early 30s or younger,** most doctors recommend trying to get pregnant for at least a year before having any testing or treatment.
- **If you're between 35 and 40,** discuss your concerns with your doctor after six months of trying.
- **If you're older than 40,** your doctor may want to begin testing or treatment right away.

Your doctor also may want to begin testing or treatment right away if you or your partner has known fertility problems, or if you have a history of irregular or painful periods, pelvic inflammatory disease, repeated miscarriages, prior cancer treatment, or endometriosis.

To become pregnant, each of these factors is essential:

- **You need to ovulate.**Achieving pregnancy requires that your ovaries produce and release an egg, a process known as ovulation. Your doctor can help evaluate your menstrual cycles and confirm ovulation.

- **Your partner needs sperm.**For most couples, this isn't a problem unless your partner has a history of illness or surgery. Your doctor can run some simple tests to evaluate the health of your partner's sperm.
- **You need to have regular intercourse.** You need to have regular sexual intercourse during your fertile time. Your doctor can help you better understand when you're most fertile during your cycle.
- **You need to have open fallopian tubes and a normal uterus.** The egg and sperm meet in the fallopian tubes, and the pregnancy needs a healthy place to grow.

For pregnancy to occur, every part of the complex human reproduction process has to take place just right. The steps in this process are as follows:

- One of the two ovaries releases a mature egg.
- The egg is picked up by the fallopian tube.
- Sperm swim up the cervix, through the uterus and into the fallopian tube to reach the egg for fertilization.
- The fertilized egg travels down the fallopian tube to the uterus.
- The fertilized egg implants and grows in the uterus.

In women, a number of factors can disrupt this process at any step. Female infertility is caused by one or more of these factors.

Ovulation disorders

Ovulation disorders, meaning you ovulate infrequently or not at all, account for infertility in about 25 percent of infertile couples. These can be caused by flaws in the regulation of reproductive hormones by the hypothalamus or the pituitary gland, or by problems in the ovary itself.

- **Polycystic ovary syndrome (PCOS).** In PCOS, complex changes occur in the hypothalamus, pituitary gland and ovaries, resulting in a hormone imbalance, which affects ovulation. PCOS is associated with insulin resistance and obesity, abnormal hair growth on the face or body, and acne. It's the most common cause of female infertility.
- **Hypothalamic dysfunction.** The two hormones responsible for stimulating ovulation each month — follicle-stimulating hormone (FSH) and luteinizing hormone (LH) — are produced by the pituitary gland in a specific pattern during the menstrual cycle. Excess physical or emotional stress, a very high or very low body weight, or a recent substantial weight gain or loss can disrupt this pattern and affect ovulation. The main sign of this problem is irregular or absent periods.
- **Premature ovarian insufficiency.** This disorder is usually caused by an autoimmune response where your body mistakenly attacks ovarian tissues or by premature loss of

eggs from your ovary due to genetic problems or environmental insults such as chemotherapy. It results in the loss of the ability to produce eggs by the ovary, as well as a decreased estrogen production under the age of 40.

- **Too much prolactin.** Less commonly, the pituitary gland can cause excess production of prolactin (hyperprolactinemia), which reduces estrogen production and may cause infertility. Most commonly this is due to a problem in the pituitary gland, but it can also be related to medications you're taking for another disease.

Damage to fallopian tubes (tubal infertility)

When fallopian tubes become damaged or blocked, they keep sperm from getting to the egg or block the passage of the fertilized egg into the uterus. Causes of fallopian tube damage or blockage can include:

- Pelvic inflammatory disease, an infection of the uterus and fallopian tubes due to chlamydia, gonorrhea or other sexually transmitted infections
- Previous surgery in the abdomen or pelvis, including surgery for ectopic pregnancy, in which a fertilized egg becomes implanted and starts to develop in a fallopian tube instead of the uterus
- Pelvic tuberculosis, a major cause of tubal infertility worldwide, although uncommon in the United States

Endometriosis

Endometriosis occurs when tissue that normally grows in the uterus implants and grows in other locations. This extra tissue growth — and the surgical removal of it — can cause scarring, which may obstruct the tube and keep the egg and sperm from uniting. It can also affect the lining of the uterus, disrupting implantation of the fertilized egg. The condition also seems to affect fertility in less-direct ways, such as damage to the sperm or egg.

Uterine or cervical causes

Several uterine or cervical causes can impact fertility by interfering with implantation or increasing the likelihood of a miscarriage.

- Benign polyps or tumors (fibroids or myomas) are common in the uterus, and some types can impair fertility by blocking the fallopian tubes or by disrupting implantation. However, many women who have fibroids or polyps can become pregnant.
- Endometriosis scarring or inflammation within the uterus can disrupt implantation.
- Uterine abnormalities present from birth, such as an abnormally shaped uterus, can cause problems becoming or remaining pregnant.

- Cervical stenosis, a cervical narrowing, can be caused by an inherited malformation or damage to the cervix.
- Sometimes the cervix can't produce the best type of mucus to allow the sperm to travel through the cervix into the uterus.

Unexplained infertility

In some instances, a cause for infertility is never found. It's possible that a combination of several minor factors in both partners underlie these unexplained fertility problems. Although it's frustrating to not get a specific answer, this problem may correct itself with time.

Certain factors may put you at higher risk of infertility, including:

- **Age.** With increasing age, the quality and quantity of a woman's eggs begin to decline. In the mid-30s, the rate of follicle loss accelerates, resulting in fewer and poorer quality eggs, making conception more challenging and increasing the risk of miscarriage.
- **Smoking.** Besides damaging your cervix and fallopian tubes, smoking increases your risk of miscarriage and ectopic pregnancy. It's also thought to age your ovaries and deplete your eggs prematurely, reducing your ability to get pregnant. Stop smoking before beginning fertility treatment.
- **Weight.** If you're overweight or significantly underweight, it may hinder normal ovulation. Getting to a healthy body mass index (BMI) has been shown to increase the frequency of ovulation and likelihood of pregnancy.
- **Sexual history.** Sexually transmitted infections such as chlamydia and gonorrhea can cause fallopian tube damage. Having unprotected intercourse with multiple partners increases your chances of contracting a sexually transmitted disease (STD) that may cause fertility problems later.
- **Alcohol.** Heavy drinking is associated with an increased risk of ovulation disorders and endometriosis.

For an infertility evaluation, you'll likely see a reproductive endocrinologist — a doctor who specializes in treating disorders that prevent couples from conceiving. Your doctor will likely want to evaluate both you and your partner to identify potential causes — and possible treatments — for infertility.

What you can do

To prepare for your appointment:

- **Chart your menstrual cycles and associated symptoms for a few months.** On a calendar or an electronic device, record when your period starts and stops and how

your cervical mucus looks. Make note of days when you and your partner have intercourse.

- **Make a list of any medications, vitamins, herbs or other supplements you take.** Include the doses and how often you take them.
- **Bring previous medical records.** Your doctor will want to know what tests you've had and what treatments you've already tried.
- **Bring a notebook or electronic device with you.** You may receive a lot of information at your visit, and it can be difficult to remember everything.
- **Think about what questions you'll ask.** List the most important questions first in case time runs out.

Some basic questions to ask include:

- When and how often should we have intercourse if we hope to conceive?
- Are there any lifestyle changes we can make to improve the chances of getting pregnant?
- Do you recommend any testing? If so, what kind?
- Are medications available that might improve the ability to conceive?
- What side effects can the medications cause?
- Would you explain our treatment options in detail?
- What treatment do you recommend in our situation?
- What's your success rate for assisting couples in achieving pregnancy?
- Do you have any brochures or other printed materials that we can have?
- What websites do you recommend visiting?

Don't hesitate to ask your doctor to repeat information or to ask follow-up questions.

What to expect from your doctor

Some potential questions your doctor or other health care provider might ask include:

- How long have you been trying to become pregnant?
- How often do you have intercourse?
- Have you ever been pregnant? If so, what was the outcome of that pregnancy?
- Have you had any pelvic or abdominal surgeries?
- Have you been treated for any gynecological conditions?
- At what age did you first start having periods?
- On average, how many days pass between the beginning of one menstrual cycle and the beginning of your next menstrual cycle?
- Do you experience premenstrual symptoms, such as breast tenderness, abdominal bloating or cramping?

If you've been unable to conceive within a reasonable period of time, seek help from your doctor for further evaluation and treatment of infertility.

Fertility tests may include:

- **Ovulation testing.** An over-the-counter ovulation prediction kit — a test that you can perform at home — detects the surge in luteinizing hormone (LH) that occurs before ovulation. If you have not had positive home ovulation tests, a blood test for progesterone — a hormone produced after ovulation — can document that you're ovulating. Other hormone levels, such as prolactin, also may be checked.
- **Hysterosalpingography.** During hysterosalpingography (his-tur-o-sal-ping-GOG-ruh-fee), X-ray contrast is injected into your uterus and an X-ray is taken to determine if the uterine cavity is normal and whether the fluid passes out of the uterus and spills out of your fallopian tubes. If abnormalities are found, you'll likely need further evaluation. In a few women, the test itself can improve fertility, possibly by flushing out and opening the fallopian tubes.
- **Ovarian reserve testing.** This testing helps determine the quality and quantity of eggs available for ovulation. Women at risk of a depleted egg supply — including women older than 35 — may have this series of blood and imaging tests.
- **Other hormone testing.** Other hormone tests check levels of ovulatory hormones as well as thyroid and pituitary hormones that control reproductive processes.
- **Imaging tests.** Pelvic ultrasound looks for uterine or fallopian tube disease. Sometimes a hysterosonography (his-tur-o-suh-NOG-ruh-fee) is used to see details inside the uterus that are not seen on a regular ultrasound.

Depending on your situation, rarely your testing may include:

- **Other imaging tests.** Depending on your symptoms, your doctor may request a hysteroscopy to look for uterine or fallopian tube disease.
- **Laparoscopy.** This minimally invasive surgery involves making a small incision beneath your navel and inserting a thin viewing device to examine your fallopian tubes, ovaries and uterus. Laparoscopy may identify endometriosis, scarring, blockages or irregularities of the fallopian tubes, and problems with the ovaries and uterus.
- **Genetic testing.** Genetic testing helps determine whether there's a genetic defect causing infertility.

How your infertility is treated depends on the cause, your age, how long you've been infertile and personal preferences. Because infertility is a complex disorder, treatment involves significant financial, physical, psychological and time commitments. Although some women need just one or two therapies to restore fertility, it's possible that several different types of treatment may be needed before you're able to conceive.

Treatments can either attempt to restore fertility — by means of medication or surgery — or assist in reproduction with sophisticated techniques.

Fertility restoration: Stimulating ovulation with fertility drugs

Fertility drugs, which regulate or induce ovulation, are the main treatment for women who are infertile due to ovulation disorders. In general, they work like the natural hormones — follicle-stimulating hormone (FSH) and luteinizing hormone (LH) — to trigger ovulation. They are also used in women who ovulate to try to stimulate a better egg or an extra egg or eggs. Fertility drugs may include:

- **Clomiphene citrate.** Clomiphene citrate (Clomid, Serophene)is taken by mouth and stimulates ovulation by causing the pituitary gland to release more FSH and LH, which stimulate the growth of an ovarian follicle containing an egg.
- **Gonadotropins.** Instead of stimulating the pituitary gland to release more hormones, these injected treatments stimulate the ovary directly. Gonadotropin medications include human menopausal gonadotropin or hMG (Repronex, Menopur) and FSH (Gonal-F, Follistim AQ, Bravelle). All act to stimulate production of multiple eggs. Another gonadotropin, human chorionic gonadotropin (Ovidrel, Pregnyl), is used to mature the eggs and trigger their release at the time of ovulation.
- **Metformin.** Metformin (Glucophage, others) is used when insulin resistance is a known or suspected cause of infertility, usually in women with a diagnosis of PCOS. Metformin helps improve insulin resistance, which can make ovulation more likely to occur.
- **Letrozole.** Letrozole (Femara) belongs to a class of drugs known as aromatase inhibitors and works in a similar fashion to clomiphene. Letrozole may induce ovulation. However, the effect this medication has on early pregnancy isn't yet known, so it isn't used for ovulation induction as frequently as others.
- **Bromocriptine.** Bromocriptine (Parlodel, Cycloset) may be used when ovulation problems are caused by excess production of prolactin (hyperprolactinemia) by the pituitary gland.

Risks of fertility drugs

Using fertility drugs carries some risks, such as:

- **Pregnancy with multiples.** Oral medications carry a fairly low risk of multiples (less than 10 percent) and mostly a risk of twins, but your chances increase to about 15 to 20 percent with injectable medications. Injectable fertility medications also carry the major risk of triplets or more (higher order multiple pregnancy). Generally, the more fetuses you're carrying, the greater the risk of premature labor, low birth weight and

later developmental problems. Sometimes adjusting medications can lower the risk of multiples, if too many follicles develop.

- **Ovarian hyperstimulation syndrome (OHSS).** Use of injectable fertility drugs to induce ovulation can cause OHSS, in which your ovaries become swollen and painful. Signs and symptoms typically last a week and include mild abdominal pain, bloating, nausea, vomiting and diarrhea. If you become pregnant, however, your symptoms might last several weeks. Rarely, it's possible to develop a more severe form of OHSS that can also cause rapid weight gain, enlarged painful ovaries, fluid in the abdomen and shortness of breath.
- **Long-term risks of ovarian tumors.** Most studies of women using fertility drugs suggest that there are few if any long-term risks. However, some studies suggest that women taking fertility drugs for 12 or more months without a successful pregnancy may have an associated increased risk of borderline ovarian tumors later in life. Women who never have pregnancies have an increased risk of ovarian tumors, so it may be related to the underlying problem rather than the treatment. However, since success rates are typically higher in the first few cycles, re-evaluating medication use every few months and concentrating on the treatments that have the most success appear to be appropriate.

Fertility restoration: Surgery

Several surgical procedures can correct problems or otherwise improve female fertility. However, surgical treatments for fertility are rare these days now that other fertility treatments have high success. They include:

- **Laparoscopic or hysteroscopic surgery.** These surgeries can remove or correct abnormalities that decrease pregnancy rates. This can include correcting an abnormal uterine shape, removing endometrial polyps and some types of fibroids that misshape the uterine cavity or pelvic or uterine adhesions. This can improve your chances of achieving pregnancy.
- **Tubal ligation reversal surgery (microscopic).** After a woman has had her tubes tied for permanent contraception (tubal ligation), surgery may be done to reconnect them and restore fertility. Your doctor can determine whether you're a good candidate for this or whether in vitro fertilization (IVF) might be a better choice for you.
- **Tubal surgeries.** If your fallopian tubes are blocked or filled with fluid (hydrosalpinx), laparoscopic surgery may be performed to remove adhesions, dilate a tube or create a new tubal opening. However, this is rarely done, as pregnancy rates are usually better with IVF. For hydrosalpinx, removal of your tubes (salpingectomy) or blocking the tubes close to the uterus can improve your chances of pregnancy with IVF.

Reproductive assistance

The most commonly used methods of reproductive assistance include:

- **Intrauterine insemination (IUI).** During IUI, millions of healthy sperm are placed inside the uterus close to the time of ovulation.
- **Assisted reproductive technology.** These methods involve retrieving mature eggs from a woman, fertilizing them with a man's sperm in a dish in a lab, then transferring the embryos into the uterus after fertilization. IVF is the most effective assisted reproductive technology. An IVF cycle takes several weeks and requires frequent blood tests and daily hormone injections.

Dealing with female infertility can be physically and emotionally exhausting. To cope with the ups and downs of infertility testing and treatment, consider these strategies:

- **Be prepared.** The uncertainty of infertility testing and treatments can be difficult and stressful. Ask your doctor to explain the steps for the therapy you've chosen so that you and your partner can prepare for each one. Understanding the process may help reduce your anxiety.
- **Seek support.** Although infertility can be a deeply personal issue, reach out to your partner, close family members or friends for support. Many online support groups allow you to maintain your anonymity while you discuss issues related to infertility. Seek professional help if the emotional burden gets too heavy for you or your partner.
- **Exercise and eat a healthy diet.** Keeping up a moderate exercise routine and a healthy diet can improve your outlook and keep you focused on living your life despite fertility problems.
- **Consider other options.** Determine alternatives — adoption, donor sperm or egg, or even having no children — as early as possible in the infertility treatment process. This can reduce anxiety during treatments and disappointment if conception doesn't occur.

If you're a woman thinking about getting pregnant soon or in the future, you may improve your chances of having normal fertility if you:

- **Maintain a normal weight.** Overweight and underweight women are at increased risk of ovulation disorders. If you need to lose weight, exercise moderately. Strenuous, intense exercise of more than seven hours a week has been associated with decreased ovulation.
- **Quit smoking.** Tobacco has multiple negative effects on fertility, not to mention your general health and the health of a fetus. If you smoke and are considering pregnancy, quit now.

- **Avoid alcohol.** Heavy alcohol use may lead to decreased fertility. And any alcohol use can affect the health of a developing fetus. If you're planning to become pregnant, avoid alcohol, and don't drink alcohol while you're pregnant.
- **Reduce stress.** Some studies have shown that couples experiencing psychological stress had poorer results with infertility treatment. If you can, find a way to reduce stress in your life before trying to become pregnant.
- **Limit caffeine.** Some physicians suggest limiting caffeine intake to less than 200 to 300 milligrams a day.