



## **INFERTILITY**

### **Q. WHAT IS INFERTILITY?**

A. Infertility is defined as the inability to conceive a child despite trying for 1 year. The condition affects about 5.3 million Americans, or 9% of the reproductive age population.

To become pregnant, a couple must have intercourse during the woman's fertile time of the month, which is right before and during ovulation. Because it is tough to pinpoint the exact day of ovulation, having intercourse every other day during this time maximizes the chances of conception.

After a year of frequent intercourse without contraception that does not result in pregnancy, a couple should go to a health-care professional for an evaluation. In some cases, it makes sense to seek help for fertility problems even before a year is up.

A woman over age 30 may wish to get an evaluation before 1 year. At age 30, a woman begins a slow decline in her ability to get pregnant. The older she gets, the greater her chance of miscarriage. However, fertility does not take a big drop until around age 40. Despite a decrease in sperm production that begins after age 25, some men remain fertile into their 60s and 70s.

A couple may also seek earlier evaluation if:

- The woman is not menstruating regularly, which may indicate an absence of ovulation that would make it impossible for her to conceive without medical help.
- The woman has had three or more miscarriages (or the man had a previous partner who had had three or more miscarriages).
- The woman or man has had certain infections that sometimes affect fertility (for example, pelvic infection in a woman, or mumps or prostate infection in a man).
- The woman or man suspects there may be a fertility problem (if, for example, attempts at pregnancy failed in a previous relationship).

### **CAUSES OF INFERTILITY**

Impairment in any step of the intricate process of conception can cause infertility. For a woman to become pregnant, her partner's sperm must be healthy so that at least one can swim into her fallopian tubes. An egg, released by the woman's ovaries, must be in the fallopian tube ready to be fertilized. Next, the fertilized egg, called an embryo, must make its way through an open-ended fallopian tube into the uterus, implant in the uterine lining, and be sustained there while it grows.

Of the 80% of cases with a diagnosed cause, about half are based at least partially on male problems (referred to as male factors)--usually that the man produces no sperm, a condition called azoospermia, or that he produces too few sperm, called oligospermia.

Lifestyle can influence the number and quality of a man's sperm. Alcohol and drugs--including marijuana, nicotine, and certain medications--can temporarily reduce sperm quality. Also, environmental toxins, including pesticides and lead, may be to blame for some cases of infertility.

The causes of sperm production problems can exist from birth or develop later as a result of severe medical illnesses, including mumps and some sexually transmitted diseases, or from a severe testicle injury, tumor, or other problem. Inability to ejaculate normally can prevent conception, too, and can be caused by many factors, including diabetes, surgery of the prostate gland or urethra, blood pressure medication, or impotence.

The other half of explained infertility cases are linked to female problems (called female factors), most commonly ovulation disorders. Without ovulation, eggs are not available for fertilization. Problems with ovulation are signaled by irregular menstrual periods or a lack of periods altogether (called amenorrhea). Simple lifestyle factors--including stress, diet, or athletic training--can affect a woman's hormonal balance. Much less often, a hormonal imbalance can result from a serious medical problem such as a pituitary gland tumor.

Other problems can also lead to female infertility. If the fallopian tubes are blocked at one or both ends, the egg can't travel through the tubes into the uterus. Such blockage may result from pelvic inflammatory disease, surgery for an ectopic pregnancy (when the embryo implants in the fallopian tube rather than in the uterus), or other problems, including endometriosis (the abnormal presence of uterine lining cells in other pelvic organs).

A medical evaluation may determine whether a couple's infertility is due to these or other causes. If a medical and sexual history doesn't reveal an obvious problem, like improperly timed intercourse or absence of ovulation, specific tests may be needed.

### **WHAT TESTS ARE NEEDED**

The man's evaluation focuses on the number and health of his sperm. The laboratory first examines a sperm sample under a microscope to check sperm number, shape and movement. Further tests may be needed to look for infection, hormonal imbalance, or other problems.

Tests used to test the sperm include:

- X-ray: If damage to one or both of the vas deferens (the ducts in the male that transport the sperm to the penis) is known or suspected, an x-ray is taken to examine the organs.

- Mucus penetrance test: Test of whether the man's sperm are able to swim through a drop of the woman's fertile vaginal mucus on a slide (also used to test the quality of the woman's mucus).
- Hamster-egg penetrance assay: Test of whether the man's sperm will penetrate hamster egg cells with their outer cells removed, indicating somewhat their ability to fertilize human eggs.

For the woman, the first step in testing is to determine if she is ovulating each month. This can be done by charting changes in morning body temperature, or use an ovulation test kit (which is available over the counter), or by examining cervical mucus, which undergoes a series of hormone-induced changes throughout the menstrual cycle.

Checks of ovulation can also be done in the physician's office with simple blood tests for hormone levels or ultrasound tests of the ovaries. If the woman is ovulating, further testing will need to be done.

Common female tests include:

- Hysterosalpingogram: An x-ray of the fallopian tubes and uterus after they are injected with dye, to show if the tubes are open and to show the shape of the uterus.
- Laparoscopy: An examination of the tubes and other female organs for disease, using a miniature light-transmitting tube called a laparoscope. The tube is inserted into the abdomen through a one-inch incision below the navel, usually while the woman is under general anesthesia.
- Endometrial biopsy: An examination of a small shred of uterine lining to see if the monthly changes in the lining are normal.

Some tests require participation of both partners. Samples of cervical mucus taken after intercourse can show whether sperm and mucus have properly interacted. Also, a variety of tests can show if the man or woman is forming antibodies that are attacking the sperm.

## **TREATMENT**

Depending on what the tests turn up, different treatments are recommended. Drugs or surgery are used to treat infertility in 80% to 90% of cases.

Therapy with the fertility drug Clomid or with a more potent hormone stimulator-- Pergonal, Metrodin, Humegon, or Fertinex--is often recommended for women with ovulation problems. The benefits of each drug and the side effects, which can be minor or serious but rare, should be discussed with the doctor. Multiple births occur in 10% to 20% of births resulting from fertility drug use.

Other drugs, used under very limited circumstances, include Parlodel (bromocriptine mesylate), for women with elevated levels of a hormone called prolactin, and a hormone pump that releases gonadotropins necessary for ovulation.

If drugs aren't the answer, surgery may be. Because major surgery is involved, operations to repair damage to the woman's ovaries, fallopian tubes, or uterus are recommended only if there is a good chance of restoring fertility.

In the man, one infertility problem often treated surgically is damage to the vas deferens, commonly caused by a sexually transmitted disease, other infection, or vasectomy (male sterilization).

Other important tools in the battle against infertility include artificial insemination and the so-called assisted reproductive technologies.

### **ASSISTED REPRODUCTIVE TECHNOLOGY**

In some cases, a woman may not be able to become pregnant with her partner because his sexual problems make it impossible for him to ejaculate normally during sex, or because the sperm have to bypass the vagina if the vaginal mucus cannot support them, or for other reasons. In these cases, through artificial insemination, the semen is placed into the woman's uterus or vaginal canal using a hollow, flexible tube called a catheter.

New, more complex assisted reproductive technologies, or ART, procedures, include in vitro fertilization (IVF). IVF makes it possible to combine sperm and eggs in a laboratory for a baby that is genetically related to one or both partners.

IVF is often used when a woman's fallopian tubes are blocked. First, medication is given to stimulate the ovaries to produce multiple eggs. Once mature, the eggs are suctioned from the ovaries (1) and placed in a laboratory culture dish with the man's sperm for fertilization (2). The dish is then placed in an incubator (3). About 2 days later, three to five embryos are transferred to the woman's uterus (4). If the woman does not become pregnant, she may try again in the next cycle.

Other ART procedures, based on many of the same principles, include:

- Gamete intrafallopian transfer, or GIFT: Similar to IVF, but used when the woman has at least one normal fallopian tube. Three to five eggs are placed in the fallopian tube, along with the man's sperm, for fertilization inside the woman's body.
- Zygote intrafallopian transfer, or ZIFT (also called tubal embryo transfer): A hybrid of IVF and GIFT. The eggs retrieved from the woman's ovaries are fertilized in the lab and replaced in the fallopian tubes rather than the uterus.
- Donor egg IVF: For women who, for example, have impaired ovaries or carry a genetic disease that can be transferred to the offspring. Eggs are donated by another healthy woman and fertilized in the lab with the male partner's sperm before being transferred to the female partner's uterus.
- Frozen embryos: Excess embryos are frozen, to be thawed in the future if the woman doesn't get pregnant on the first cycle or wants another baby in the future.

New treatments for male factors are evolving quickly. For example, intracytoplasmic sperm injection is a new procedure in which a single egg is

injected with a single sperm to produce an embryo that can implant and grow in the uterus.

About two-thirds of births from ART procedures are single births. Of the rest, almost all are twins, with about 6% resulting in the birth of triplets or more.

**THOMAS G. STOVALL, M.D.**

Dr. Stovall is a Clinical Professor of Obstetrics and Gynecology at the University of Tennessee Health Science Center in Memphis, Tennessee and Partner of Women's Health Specialists, Inc.

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**Health Information Provided by Women's Health Specialists**

7800 Wolf Trail Cove, Germantown, TN 38138, (901) 682-9222, [www.whsobgyn.com](http://www.whsobgyn.com)

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