Male Infertility

Infertility is a common yet complex problem affecting approximately 15 percent of couples attempting to conceive a baby. In up to 50 percent of couples having difficulty getting pregnant, the problem is at least in part related to male reproductive issues. It is essential that men be assessed to pinpoint the treatable or untreatable causes of this heartbreaking health issue. Fortunately, with today's high-tech procedures and powerful drugs, a diagnosis of infertility may simply mean the road to parenthood may be challenging but not impossible. So read below to learn more about the available treatment options so you are better prepared when talking with your urologist and/or fertility specialist.

What happens under normal conditions?
Male fertility depends on the production of normal sperm and the delivery of it to a female partner's vagina. The process begins with spermatogenesis, or the development of sperm in the testicles. Sperm cells (spermatozoa) are produced by a complicated process of cell division that occurs over a period of several months. Once formed, sperm leave the testicle and are stored in the epididymis where they fully develop. They are then pushed through the vas deferens and urethra during ejaculation. The production and maturation of sperm require the presence of an intact genetic blueprint in addition to a favorable environment. In particular, the presence of adequate levels of the male hormone testosterone and a slightly decreased scrotal temperature are necessary.

What is male infertility?
Male infertility is any condition in which the man adversely affects the chances of initiating a pregnancy with his female partner. Most commonly, those problems arise when the man is unable to produce or deliver fully-functioning sperm.

What causes male infertility?
Your doctor will be interested in any factor, including possible structural and other defects in the reproductive system, hormonal deficiencies, illness or even trauma that might be impairing your fertility. Their investigation will center on many possible combinations of factors, the most common of which are:

Sperm disorders: Problems with the production and development of sperm are the most common problems of male infertility. Sperm may be underdeveloped, abnormally shaped or unable to move properly. Or, normal sperm may be produced in abnormally low numbers (oligospermia) or seemingly not at all (azoospermia).

Varicoceles: These dilated scrotal veins are present in 16 percent of all men but are more common in infertile men—40 percent. They impair sperm development by preventing proper drainage of blood. Varicoceles are easily discovered on physical examination since the veins feel distinctively like a bag of worms. They may also be enlarged and twisted enough to be visible in the scrotum. This is the most common correctable cause of male infertility.

Retrograde ejaculation: Retrograde ejaculation occurs when semen pushes backwards into the bladder instead of out the penis. This is caused by the failure of nerves and muscles in the bladder neck to close during orgasm. It is one of several difficulties couples may have delivering sperm to the vagina during intercourse. Retrograde ejaculation can be caused by previous surgery, medications or diseases affecting the nervous system. Signs of this condition may include cloudy urine after ejaculation and diminished or "dry" ejaculation with orgasm.

Immunologic infertility: Triggered by a man's immunologic response to his own sperm, antibodies are usually the product of injury, surgery or infection. In attacking the sperm, they prevent normal movement and function of the sperm. Although researchers do not yet understand just exactly how antibodies damage fertility, they know that these antibodies can make it more difficult for sperm to swim to the uterus and penetrate eggs.

Obstruction: Blocking sperm from its normal passage, obstructions can be caused by a number of factors, such as repeated infections, prior surgery (including vasectomy), inflammation or development problems. Any portion of the male reproductive tract, such as the vas deferens or epididymis, can be obstructed, preventing normal transport of sperm from the testicles to the urethra, where it leaves the body during ejaculation.

Hormones: Hormones produced by the pituitary gland are responsible for stimulating the testicles to make sperm. Therefore, when levels are severely low, poor sperm development can result.

Genetics: Genetics play a central role in fertility, particularly since sperm carry half of the DNA mix to the partner's egg. Abnormalities in chromosomal numbers and structure as well as deletions on the important Y chromosome present in normal males can also impact fertility.

Medication: Certain medications can affect sperm production, function and ejaculation. Such medications are usually prescribed to treat conditions like arthritis, depression, digestive problems, infections, hypertension and even cancer.

How is male infertility diagnosed?
The process begins with a complete history and physical exam and is usually followed by blood work and semen analysis.

From a sample of semen routinely obtained through masturbation into a sterilized cup, the physician will be able to assess factors—volume, count, concentration, movement and structure of spermatozoa—that help or hinder conception.

Even if the semen analysis shows low sperm numbers, or even no sperm, it does not necessarily mean absolute infertility. Low values in any of the above categories may just indicate a problem with the development or delivery of sperm that simply requires further evaluation.

For instance, your physician may order a transrectal ultrasound, an imaging test that places a probe into the rectum to beam high-frequency sound waves to nearby ejaculatory ducts. This test can help your physician determine if these structures are either poorly developed or obstructed with cysts, calcifications or other blockages.

A testicular biopsy comes into play when a semen analysis shows very low number of sperm or no sperm. This test is performed in an operating room under general or regional anesthesia through a small cut in the scrotum. It may also be done in a clinic using a needle inserted through skin over the testicle that has been anesthetized. In either case, a small piece of tissue is removed from each testicle for microscopic evaluation. The biopsy serves two purposes: to determine the cause of infertility, and, if necessary, to retrieve sperm for use in assisted reproduction.

Besides a semen analysis, your doctor may order a hormonal profile to discover the sperm-producing ability of your testicles and to rule out serious conditions. For instance, follicle-stimulating hormone (FSH) is the pituitary hormone responsible for stimulating testicles to produce sperm. High levels may indicate that the pituitary is trying to stimulate the testicles to make sperm though they are not responding.

How is male infertility treated?
The treatment for male infertility depends on the specific problem. In some severe cases, no treatment is available. However, many times there are a mix of medications, surgical approaches and assisted reproductive techniques (ART) available to overcome many of the underlying fertility problems. The options are:

Surgery: Minor outpatient surgery (varicocelectomy) is frequently used to repair dilated scrotal veins (varicoceles). Studies have shown that repairing these dilated veins results in improved sperm movement, concentration and structure. In some cases, obstruction causing infertility can also be surgically corrected. In the case of a previous vasectomy, surgery using an operating microscope has been found to be very successful in reversing the obstruction.

Medication: Drugs are key in correcting retrograde ejaculation and immunologic infertility. In addition, pituitary hormone deficiency may be corrected with drugs such as clomiphene or gonadotropin.

If these techniques fail, fertility specialists have a variety of other high-tech assisted reproductive techniques that promote conception without intercourse. Depending on your problem your physician may look to:

Intrauterine insemination (IUI): By placing sperm directly into the uterus via a catheter, IUI bypasses cervical mucus that may be hostile to the sperm and puts them close to the fallopian tubes where fertilization occurs. IUI is often successful in overcoming sperm count and movement problems, retrograde ejaculation, immunologic infertility and other causes of infertility.

In vitro fertilization (IVF): Refers to fertilization taking place outside the body in a laboratory Petri dish. There, the egg of a female partner or donor is joined with sperm. With IVF, the ovaries must be overly stimulated, usually with fertility drugs that allow retrieval of multiple mature eggs. After 48 to 72 hours of incubation, the

fertilized egg (embryo) is inserted in the uterus and normal pregnancy should result. While IVF is employed mostly for women with obstructed fallopian tubes, it is occasionally used for men with oligospermia.

Intracytoplasmic sperm injection (ICSI): A variation of in vitro fertilization, this procedure has revolutionized treatment of severe male infertility, permitting couples previously thought infertile to conceive. It involves injecting a single sperm directly into the egg with a microscopic needle and then, once it is fertilized, transferring it to the female partner's uterus. Your doctor is likely to use ICSI if you have very poor semen quality or lack of sperm in the semen caused by an obstruction or testicular failure. In some cases, sperm may be surgically extracted from the testicles or epididymis for this procedure.

Frequently asked questions:

What diseases can cause male factor infertility?
A variety of diseases—from kidney disease to testicular cancer—can result in male infertility. For instance, systemic conditions and metabolic disorders, along with ordinary fevers and infections, can impair the development of sperm. In addition, sexually transmitted diseases can lead to obstruction and scarring of the reproductive tract while genetic conditions, such as cystic fibrosis, may result in lack of sperm due to missing vas deferens or seminal vesicles. Since any number of illnesses can be a factor, it is essential that both you and your partner know and share your family and personal medical histories with your doctor.

Can cigarette smoke affect semen?
Yes. Research has shown that regular smoking impacts the sperm in a variety of ways. It decreases the size and movement of these cells and damages their DNA content. Smoking also can impact the seminal fluid, ejaculated with the sperm.

Can the use of steroids for body building cause infertility?
Yes. Steroids taken either by mouth or injection can shut down the production of hormones needed for sperm production.

Do abnormal semen analyses or sperm lead to children with birth defects?
Not necessarily. For the majority of couples seeking fertility treatment, the risk of conceiving a child with a birth defect is the same as the general population. Though, some disorders (especially genetic disorders) that cause infertility may also cause an increased risk of conceiving a child with birth defects. It is for this reason that couples need thorough evaluation and counseling prior to proceeding with some forms of assisted reproductive techniques.

What is the most important thing I should remember about male infertility?
Neither you nor your partner should be blamed for any problems you have with fertility. The American Society of Reproductive Medicine (ASRM) estimates that roughly one-third of infertility cases can be attributed to male factors, with another one-third due to women. In the remaining one-third of infertile couples, infertility is caused by either a combination of factors, or, in 20 percent of cases, is still unexplained. (In men, few or no sperm is the biggest problem; in women, the common problems are ovulation disorders and blocked tubes.) But today, physicians have the technology and surgical tools to address many of those problems.