

Original link: <http://www.uptodate.com/contents/evaluation-of-the-infertile-couple-beyond-the-basics>

## **Patient information: Evaluation of the infertile couple (Beyond the Basics)**

### **OVERVIEW OF INFERTILITY**

Infertility is defined as the inability of a couple to become pregnant after one year of unprotected intercourse. Infertility is a common condition: in any given year, about 15 percent of the couples in the United States who are trying to conceive are not able to do so.

The ability of a couple to become pregnant depends on normal fertility in both the male and female partners. Among all cases of infertility in developed countries, about 8 percent can be traced to male problems, 37 percent can be traced to female problems, and 35 percent can be traced to problems in both the male and female partners. In about 5 percent of couples, the cause of the infertility cannot be traced to specific problems in either partner.

Because pregnancy requires normal fertility in both the male and female, healthcare providers routinely involve both partners in the evaluation.

### **EVALUATION OF INFERTILITY IN MEN**

Fertility in men requires normal functioning of the hypothalamus, pituitary gland, and testes. Therefore, a variety of different conditions can lead to infertility. The evaluation of male infertility may point to an underlying cause, which can guide treatment. A healthcare provider usually begins with a medical history, physical examination, and a semen test. Other tests may be needed.

**History** — A man's past health and medical history are important in the process of evaluation. A healthcare provider will ask about childhood growth and development; sexual development during puberty; sexual history; illnesses and infections; surgeries; medications; exposure to certain environmental agents (alcohol, radiation, steroids, chemotherapy, and toxic chemicals); and any previous fertility testing.

**Physical examination** — A physical examination usually includes measurement of height and weight, assessment of body fat and muscle distribution, inspection of the skin and hair pattern, and visual examination of the genitals and breasts ([figure 1](#)).

Special attention is given to features of testosterone deficiency, which may include loss of facial and body hair and decrease in the size of the testis.

Other conditions that might affect fertility include:

- Varicocele, a varicose vein of the testicle
- Absent vas deferens or thickening of the epididymis ([figure 1](#))

### Semen analysis

Lab testing — A semen analysis (sperm count) is a central part of the evaluation of male infertility. This analysis provides information about the amount of semen and the number, motility, and shape of sperm.

A man should avoid ejaculation (sex and masturbation) for two to seven days before providing the semen sample. Ideally, a sample should be collected in a clinician's office after masturbation; if this is not possible, the man may collect a sample at home in a sterile laboratory container or chemical-free condom. The sample should be delivered to the lab within one hour of collection.

If the initial semen analysis is abnormal, the clinician will often request an additional sample; this is best done one to two weeks later.

Blood tests — Blood tests provide information about hormones that play a role in male fertility. If sperm concentration is low or the clinician suspects a hormonal problem, the clinician may order blood tests to measure total testosterone, luteinizing hormone (LH), follicle-stimulating hormone (FSH), and prolactin (a pituitary hormone).

Genetic tests — If genetic or chromosomal abnormalities are suspected, specialized blood tests may be needed to check for absent or abnormal regions of the male chromosomes (Y chromosome). Some men inherit genes associated with cystic fibrosis that can result in male infertility due to a low sperm count. However, these men do not have the other usual signs of cystic fibrosis, such as lung or gastrointestinal disease.

Although infertility treatments may be able to overcome genetic or chromosomal abnormalities, there is a possibility of transferring the abnormality to a child. In this case, genetic counseling is often recommended to inform a couple about the possibility of parent-to-child transmission and the possible impact of the abnormality.

Other tests — If a blockage in the reproductive tract (epididymis or vas deferens) is suspected, a transrectal ultrasound test may be ordered.

If retrograde ejaculation (movement of semen into the bladder) is suspected, a post-ejaculation urine sample is needed.

A testicular biopsy (collection of a small tissue sample) may be recommended in men with no sperm on the semen analysis. The biopsy can be done by surgically opening the testis or by fine-needle aspiration (inserting a small needle into the testis and withdrawing a sample of tissue). An open biopsy is usually done in an operating room with general anesthesia, while a fine-needle aspiration may be done with local anesthesia in an office setting. The biopsy allows the physician to examine the microscopic structure of the testes and determine if sperm are present. The presence of sperm production in the testes when there are none in the ejaculate suggests blockage in the reproductive tract.

## EVALUATION OF INFERTILITY IN WOMEN

Although a variety of tests are available for evaluating female infertility, it may not be necessary to have all of these tests. Healthcare providers usually begin with a medical history, a thorough physical examination, and some preliminary tests.

**Medical history** — A woman's past health and medical history may provide some clues about the cause of infertility. The healthcare provider will ask about childhood development; sexual development during puberty; sexual history; illnesses and infections; surgeries; medications used; exposure to certain environmental agents (alcohol, radiation, steroids, chemotherapy, and toxic chemicals); and any previous fertility evaluations.

**Menstrual history** — Amenorrhea (absent menstrual periods) usually signals an absence of ovulation, which can cause infertility. Oligomenorrhea (irregular menstrual cycles) can be a sign of irregular ovulation; although oligomenorrhea does not make pregnancy impossible, it can interfere with the ability to become pregnant. (See ["Patient information: Absent or irregular periods \(Beyond the Basics\)"](#).)

**Physical examination** — A physical examination usually includes a general examination, with special attention to any signs of hormone deficiency or signs of other conditions that might impair fertility. The provider will also perform a pelvic examination, which can identify abnormalities of the reproductive tract and signs of low hormone levels ([figure 2](#)). The physical examination may be performed by the patient's primary care provider, gynecologist, or infertility specialist.

**Blood tests** — Blood tests can provide information about the levels of several hormones that play a role in female fertility; in women, key hormones are produced by the hypothalamus, the pituitary gland, and the ovaries. These hormones include follicle-stimulating hormone (FSH) to assess how well the ovaries are functioning, TSH to test thyroid function, and prolactin to assess the presence of a benign pituitary tumor.

**Tests to evaluate ovulation** — Ovulation (the release of an egg from an ovary) is essential for fertility. Abnormalities of ovulation can often be determined from a woman's menstrual history or hormone levels such as the pre-ovulatory LH surge or luteal phase progesterone ([figure 3](#)).

**Basal body temperature** — Monitoring of basal body temperature (measured before getting out of bed in the morning) was previously recommended to determine if ovulation occurred. A woman's temperature usually rises by 0.5°F to 1.0°F after ovulation. However, basal body temperature patterns can be difficult to interpret and are not generally recommended in the evaluation of infertility.

**Hormone levels** — Levels of luteinizing hormone (LH) rise abruptly approximately 38 hours before ovulation. This hormone surge can be detected using an over-the-counter home urine test. However, this kit fails to detect the hormone surge about 15 percent of the time. Therefore, a clinician may recommend a blood test to confirm ovulation.

Blood levels of the hormone progesterone are a more accurate indicator of ovulation. Normally, levels of progesterone rise after ovulation. A test to measure the progesterone level is usually performed 20 to 24 days after the first day of a menstrual period.

Tests to evaluate the uterus and fallopian tubes — Uterine abnormalities that can contribute to infertility include congenital structural abnormalities, such as a uterine septum (a band of tissue that makes the uterine cavity small) ([figure 4](#)); fibroids; polyps; and structural abnormalities that can result from gynecologic procedures.

Scarring and obstruction of the fallopian tubes can occur as a result of pelvic inflammatory disease, endometriosis, or pelvic adhesions (scar tissue) from abdominal infection or surgery.

Hysterosalpingogram — Hysterosalpingogram (HSG) is used to help identify structural abnormalities of the uterus and fallopian tubes. It involves inserting a small catheter through the cervix and into the uterus. A liquid that can be seen on x-ray is injected through the catheter, which fills the uterus and fallopian tubes. An x-ray is taken after the liquid is injected, which shows the outline of the uterus and tubes. An abnormally shaped uterus or blocked fallopian tube would be visible on the x-ray.

The test is done while the woman is awake and lying on an x-ray table. Most women experience moderate to severe pelvic cramps when the liquid is injected, but this usually improves after 5 to 10 minutes. The test is usually performed five to seven days after the menstrual period (before ovulation has occurred).

Hysteroscopy — In a hysteroscopy, a small tube containing a light source is inserted through the cervix and into the uterus to directly visualize the lining of the uterus and the sites where the fallopian tubes enter the uterus. Air or fluid is injected to expand the uterus and to allow the physician to see inside the uterus.

A hysteroscopy is usually performed in women who are thought to have an abnormal uterus, based upon history, hysterosalpingogram, or ultrasound. Diagnostic hysteroscopy can be performed in the physician's office without anesthesia or sedation. If hysteroscopic surgery is necessary, this is usually performed in a day surgery operating room with a regional anesthesia (local, epidural, or spinal) or general anesthesia.

Pelvic ultrasound — In a transvaginal ultrasound, a small ultrasound probe is inserted into the vagina; this provides a clearer image of the uterus and ovaries than ultrasound that is performed through the abdomen. It does not require that the patient is sedated or anesthetized, and has few to no risks. It is used to measure the size and shape of the uterus and ovaries and to determine if there are structural abnormalities (such as fibroids or ovarian cysts). If abnormalities are seen, further testing may be needed.

Sonohysterogram — Infusion of sterile saline into the uterine cavity via a small catheter placed through the cervical opening enhances visualization of the inside of the uterus during transvaginal ultrasound.

Laparoscopy — During laparoscopy, a thin, lighted tube is inserted through a small incision in the abdomen, allowing the physician to view the uterus, ovaries, and fallopian tubes. Laparoscopy is performed as a day surgery procedure and requires that the patient receive general anesthesia.

Laparoscopy can detect damage and obstruction of the fallopian tubes, endometriosis, and other abnormalities of the pelvic structures. It is the best test for diagnosis of endometriosis or pelvic adhesions (scarring). Furthermore, endometriosis can be treated during laparoscopy, which can

help to improve pregnancy rates in women with infertility who have endometriosis. However, laparoscopy is not routinely done during an evaluation of infertility.

**Genetic tests** — Genetic testing may be recommended if there is a suspicion that genetic or chromosomal abnormalities are contributing to infertility. These tests usually require a small blood sample, which is sent to a laboratory for evaluation.

Although assisted reproductive techniques may be able to overcome genetic or chromosomal abnormalities, there is a possibility of transferring the abnormality to a child. Genetic counseling is often recommended to educate a couple about the possibility of parent-to-child transmission, possible impact of the abnormality, and treatments available to prevent parent-to-child transmission.

## EMOTIONAL SUPPORT DURING INFERTILITY EVALUATION

The inability to become pregnant can lead to a variety of emotions, including anxiety, depression, anger, shame, and guilt. In one study, 40 percent of infertility patients suffered with some type of psychiatric disorder; the most common diagnosis was an anxiety disorder (23 percent), followed by major depressive disorder (17 percent) [1].

Both men and women can suffer from these problems, which can further hinder a couple's ability to become pregnant. Psychological distress is associated with infertility treatment failure, and interventions to relieve stress are associated with increased pregnancy rates.

The best approach for treatment of psychological distress related to infertility treatment has not been determined. However, some experts suggest relaxation techniques, stress management, coping skills training, and group support. Evaluation by a psychiatrist may be needed for some persons with significant symptoms of anxiety or depression.

## INFERTILITY TREATMENT

There are a number of options for treatment of both male and female infertility. Separate topic reviews are available. (See ["Patient information: Treatment of male infertility \(Beyond the Basics\)"](#) and ["Patient information: Ovulation induction with clomiphene \(Beyond the Basics\)"](#) and ["Patient information: Infertility treatment with gonadotropins \(Beyond the Basics\)"](#) and ["Patient information: In vitro fertilization \(IVF\) \(Beyond the Basics\)"](#).)

## WHERE TO GET MORE INFORMATION

Your healthcare provider is the best source of information for questions and concerns related to your medical problem.

This article will be updated as needed on our web site ([www.uptodate.com/patients](http://www.uptodate.com/patients)). Related topics for patients, as well as selected articles written for healthcare professionals, are also available. Some of the most relevant are listed below.

**Patient level information** — UpToDate offers two types of patient education materials.

The Basics — The Basics patient education pieces answer the four or five key questions a patient might have about a given condition. These articles are best for patients who want a general overview and who prefer short, easy-to-read materials.

[Patient information: Infertility in women \(The Basics\)](#)

[Patient information: Infertility in men \(The Basics\)](#)

[Patient information: Testicular cancer \(The Basics\)](#)

Beyond the Basics — Beyond the Basics patient education pieces are longer, more sophisticated, and more detailed. These articles are best for patients who want in-depth information and are comfortable with some medical jargon.

[Patient information: Treatment of male infertility \(Beyond the Basics\)](#)

[Patient information: Absent or irregular periods \(Beyond the Basics\)](#)

[Patient information: Ovulation induction with clomiphene \(Beyond the Basics\)](#)

[Patient information: Infertility treatment with gonadotropins \(Beyond the Basics\)](#)

[Patient information: In vitro fertilization \(IVF\) \(Beyond the Basics\)](#)

Professional level information — Professional level articles are designed to keep doctors and other health professionals up-to-date on the latest medical findings. These articles are thorough, long, and complex, and they contain multiple references to the research on which they are based. Professional level articles are best for people who are comfortable with a lot of medical terminology and who want to read the same materials their doctors are reading.

[Amenorrhea and infertility associated with exercise](#)

[Causes of female infertility](#)

[Causes of male infertility](#)

[Effect of advanced age on fertility and pregnancy in women](#)

[Effects of cytotoxic agents on gonadal function in adult men](#)

[Evaluation of female infertility](#)

[Evaluation of male infertility](#)

[Reproductive surgery for female infertility](#)

[Optimizing natural fertility in couples planning pregnancy](#)

[Overview of ovulation induction](#)

[Overview of treatment of female infertility](#)

[Ovulation induction with clomiphene citrate](#)

[Pathogenesis and treatment of infertility in women with endometriosis](#)

[Strategies for improving the efficacy of clomiphene induction of ovulation](#)

[Treatment of male infertility](#)

[Unexplained infertility](#)

[Use of assisted reproduction in HIV and hepatitis infected couples](#)

The following organizations also provide reliable health information:

- National Library of Medicine

([www.nlm.nih.gov/medlineplus/healthtopics.html](http://www.nlm.nih.gov/medlineplus/healthtopics.html))

- American Society for Reproductive Medicine

([www.asrm.org](http://www.asrm.org))

- The Hormone Foundation

([www.hormone.org/public/other.cfm](http://www.hormone.org/public/other.cfm), also available in Spanish)

- The Centers for Disease Control and Prevention

([www.cdc.gov/reproductivehealth/Infertility](http://www.cdc.gov/reproductivehealth/Infertility))

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Literature review current through: Oct 2013. | This topic last updated: Jul 16, 2013.

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## References

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2. [McLaren JF. Infertility evaluation. Obstet Gynecol Clin North Am 2012; 39:453.](#)
3. [McLean M, Wellons MF. Optimizing natural fertility: the role of lifestyle modification. Obstet Gynecol Clin North Am 2012; 39:465.](#)
4. [Messerlian C, Maclagan L, Basso O. Infertility and the risk of adverse pregnancy outcomes: a systematic review and meta-analysis. Hum Reprod 2013; 28:125.](#)