
CANCER FACTS

National Cancer Institute • National Institutes of Health
Department of Health and Human Services

Testicular Cancer: Questions and Answers

Key Points

- Testicular cancer can be one of two general types: seminoma or nonseminoma (see Question 1).
- This disease occurs most often in men between the ages of 15 and 39. It accounts for only 1 percent of all cancers in men (see Question 1).
- Risk factors include having an undescended testicle, a previous testicular cancer, or having a brother or father who has had testicular cancer (see Question 2).
- Symptoms include a lump, swelling, or enlargement in the testicle; an ache in the lower abdomen, back, or groin; and pain or discomfort in a testicle or in the scrotum (see Question 3).
- Diagnosis generally involves blood tests, ultrasound, and biopsy (see Question 4).
- Treatment can often cure testicular cancer (see Question 5), but regular followup exams are extremely important (see Question 6).

1. What is testicular cancer?

Testicular cancer is a disease in which cells become malignant (cancerous) in one or both testicles.

The testicles (also called testes or gonads) are a pair of male sex glands. They produce and store sperm, and are also the body's main source of male hormones. These hormones control the development of the reproductive organs and male characteristics. The testicles are located under the penis in a sac-like pouch called the scrotum.

Testicular cancers can be broadly classified into two general types: seminoma and nonseminoma. Seminomas make up about 30 percent of all testicular cancers.



Nonseminomas are a group of cancers that include choriocarcinoma, embryonal carcinoma, teratoma, and yolk sac tumors. Testicular tumors may contain both seminoma and nonseminoma cells.

Testicular cancer accounts for only 1 percent of all cancers in men. About 7,500 men in the United States are diagnosed with testicular cancer each year. Testicular cancer occurs most often in men between the ages of 15 and 39, and is the most common form of cancer in men between the ages of 20 and 34. It is more common in white men than in black men. The testicular cancer rate has more than doubled among white men in the past 40 years, but has not changed for black men. The reason for these differences is not known.

2. **What are the risk factors for testicular cancer?**

The causes of testicular cancer are not known. However, studies show that several factors increase a man's chance of developing this disease.

- **Undescended testicle (cryptorchidism):** Normally, the testicles descend into the scrotum before birth. A man's risk for testicular cancer is increased if a testicle did not move down into the scrotum. This is true even if surgery is done to move the testicle into the scrotum.
- **Abnormal testicular development:** Men whose testicles did not develop normally are at increased risk.
- **Klinefelter's syndrome:** Men with Klinefelter's syndrome (a sex chromosome disorder that may be characterized by low levels of male hormones, sterility, breast enlargement, and small testes) are at greater risk of developing testicular cancer.
- **History of testicular cancer:** Men who have had testicular cancer are at increased risk of developing cancer in the other testicle.
- **Family history of testicular cancer:** The risk for testicular cancer is greater in men whose brother or father has had the disease.

3. **How is testicular cancer detected? What are symptoms of testicular cancer?**

Most testicular cancers are found by men themselves. Also, doctors generally examine the testicles during routine physical exams. Between regular checkups, if a man notices anything unusual about his testicles, he should talk with his doctor. Men should see a doctor if they notice any of the following symptoms:

- A painless lump or swelling in a testicle;
- Any enlargement of a testicle or change in the way it feels;
- A feeling of heaviness in the scrotum;
- A dull ache in the lower abdomen, back, or the groin (the area where the thigh meets the abdomen);
- A sudden collection of fluid in the scrotum;
- Pain or discomfort in a testicle or in the scrotum.

These symptoms can be caused by cancer or by other conditions. It is important to see a doctor to determine the cause of any symptoms.

4. **How is testicular cancer diagnosed?**

To help find the cause of symptoms, the doctor evaluates a man's general health. The doctor also performs a physical exam and may order laboratory and diagnostic tests. If a tumor is suspected, the doctor will probably suggest a biopsy, which involves surgery to remove the testicle (orchiectomy) so that samples of tissue can be examined under a microscope.

- **Blood tests** measure the levels of tumor markers. Tumor markers are substances often found in higher-than-normal amounts when cancer is present. Tumor markers such as alpha-fetoprotein (AFP), human chorionic gonadotropin (HCG), and lactase dehydrogenase (LDH) may indicate the presence of a tumor, even if it is too small to be detected by physical exams or imaging tests.
- **Ultrasound** is a diagnostic test in which high-frequency sound waves are bounced off tissues and internal organs. Their echoes produce a picture called a sonogram. Ultrasound of the scrotum can show the presence and size of a mass in the testicle. It is also helpful in ruling out other conditions, such as swelling due to infection.
- **Biopsy** (microscopic examination of testicular tissue by a pathologist) is the only sure way to know whether cancer is present. In nearly all cases of suspected cancer, the entire affected testicle is removed through an incision in the groin. This procedure is called radical inguinal orchiectomy. In rare cases (for example, when a man has only one testicle), the surgeon performs an inguinal biopsy, removing a sample of tissue from the testicle through an incision in the groin and proceeding with orchiectomy only if the pathologist finds cancer cells. (The surgeon does **not** cut through the scrotum to remove tissue. If the problem is cancer, this procedure could cause the disease to spread.)

If testicular cancer is found, more tests are needed to find out if the cancer has spread from the testicle to other parts of the body. Determining the stage (extent) of the disease helps the doctor to plan appropriate treatment.

5. **How is testicular cancer treated? What are the side effects of treatment?**

Although the incidence of testicular cancer has risen somewhat in recent years, more and more men with this disease are successfully treated. When testicular cancer is found early, the treatment can often be less aggressive and may cause fewer side effects. Treatment is also more successful when testicular cancer is found early.

Most men with testicular cancer can be cured with surgery, radiation therapy, and/or chemotherapy. The side effects depend on the type of treatment and may be different for each person.

Although seminomas and nonseminomas grow and spread in similar ways, each type may need different treatment. (If the tumor contains both seminoma and nonseminoma cells, it is treated as a nonseminoma.) Treatment also depends on the stage of the cancer, the patient's age and general health, and other factors. Treatment is often provided by a team of specialists, which may include a surgeon, a medical oncologist, and a radiation oncologist.

- **Surgery** to remove the testicle through an incision in the groin is called a radical inguinal orchiectomy. Men may be concerned that losing a testicle will affect their ability to have sexual intercourse or make them sterile (unable to produce children). However, a man with one remaining healthy testicle can still have a normal erection and produce sperm. Therefore, an operation to remove one testicle does not make a man impotent (unable to have an erection) and seldom interferes with fertility (the ability to produce children). Men can also have an artificial testicle, called a prosthesis, placed in the scrotum. The implant has the weight and feel of a normal testicle.

Some of the lymph nodes located deep in the abdomen may also be removed (lymph node dissection). This type of surgery does not change a man's ability to have an erection or an orgasm, but it can cause sterility because it interferes with ejaculation. Patients may wish to talk with the doctor about the possibility of removing the lymph nodes using a special nerve-sparing surgical technique that may preserve the ability to ejaculate normally.

- **Radiation therapy**, also called radiotherapy, uses high-energy rays to kill cancer cells and shrink tumors. Radiation therapy is a local therapy; it affects cancer cells only in the treated areas. Radiation therapy for testicular cancer comes from a machine outside the body (external beam radiation) and is usually aimed at

lymph nodes in the abdomen. Seminomas are highly sensitive to radiation. Nonseminomas are less sensitive to radiation, so men with this type of cancer usually do not undergo radiation. Radiation therapy may be given after orchiectomy.

Radiation therapy affects normal as well as cancerous cells. The side effects of radiation therapy depend mainly on the treatment dose. Common side effects include fatigue, skin changes at the site where the treatment is given, loss of appetite, nausea, and diarrhea. Radiation therapy interferes with sperm production, but most patients regain their fertility over a period of 1 to 2 years.

- **Chemotherapy** is the use of anticancer drugs to kill cancer cells throughout the body. Chemotherapy is given to destroy cancerous cells that may remain in the body after surgery. The use of anticancer drugs following surgery is known as adjuvant therapy. Chemotherapy may also be the initial treatment if the cancer is advanced; that is, if it has spread outside the testicle. Most anticancer drugs are given by injection into a vein (IV).

Chemotherapy is a systemic therapy, meaning that drugs travel through the bloodstream and affect normal as well as cancerous cells all over the body. The side effects depend largely on the specific drugs and the dose. Common side effects may include nausea, loss of hair, fatigue, diarrhea, vomiting, fever, chills, coughing/shortness of breath, mouth sores, or skin rash. Other common side effects are dizziness, numbness, loss of reflexes, or difficulty hearing. Some anticancer drugs interfere with sperm production. Although the reduction in sperm count is permanent for some patients, many others recover their fertility.

Some men with advanced or recurrent testicular cancer may have a bone marrow transplant, which allows for high doses of chemotherapy. These high doses of chemotherapy destroy the bone marrow, which makes and stores blood cells. In a transplant, however, bone marrow or peripheral stem cells are removed from the patient before chemotherapy. The cells are frozen. The patient is given high doses of chemotherapy. The cells are then thawed and returned to the patient through a needle.

Men with testicular cancer should discuss their concerns about sexual function and fertility with the doctor. If a man is to have treatment that might lead to infertility, he may want to ask the doctor about sperm banking (freezing sperm before treatment for use in the future). This procedure can allow some men to produce children after loss of fertility.

6. **Is followup treatment necessary? What does it involve?**

Regular followup exams are extremely important for men who have been treated for testicular cancer. Like all cancers, testicular cancer can recur. Men who have had testicular cancer should see their doctor regularly and should report any unusual

symptoms right away. Followup may vary for different types and stages of testicular cancer. Generally, patients are checked frequently by their doctor and have regular blood tests to measure tumor marker levels. They also have regular x-rays and computed tomography, also called CT scans or CAT scans (detailed pictures of areas inside the body created by a computer linked to an x-ray machine). Men who have had testicular cancer have an increased likelihood of developing cancer in the remaining testicle. Patients treated with chemotherapy may have an increased risk of certain types of leukemia, as well as other types of cancer. Regular followup care ensures that any changes in health are discussed, and any recurrent cancer can be treated as soon as possible.

7. Are clinical trials (research studies) available for men with testicular cancer?

Yes. Participation in clinical trials is an important treatment option for many men with testicular cancer. To develop new, more effective treatments, and better ways to use current treatments, the National Cancer Institute (NCI) is sponsoring clinical trials in many hospitals and cancer centers around the country. Clinical trials are a critical step in the development of new methods of treatment. Before any new treatment can be recommended for general use, doctors conduct clinical trials to find out whether the treatment is safe for patients and effective against the disease.

Patients who are interested in learning more about participating in clinical trials can call NCI's Cancer Information Service (see below) or access the clinical trials page of the NCI's Cancer.gov Web site at http://cancer.gov/clinical_trials on the Internet.

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Sources of National Cancer Institute Information

Cancer Information Service

Toll-free: 1-800-4-CANCER (1-800-422-6237)

TTY (for deaf and hard of hearing callers): 1-800-332-8615

NCI Online

Internet

Use <http://cancer.gov> to reach the NCI's Web site.

LiveHelp

Cancer Information Specialists offer online assistance through the *LiveHelp* link on the NCI's Web site.

This fact sheet was reviewed on 8/14/03