About Testicular Cancer

Get an overview of testicular cancer and the latest key statistics in the US.

Overview and Types

If you have been diagnosed with testicular cancer or are worried about it, you likely have a lot of questions. Learning some basics is a good place to start.

- What Is Testicular Cancer?

Research and Statistics

See the latest estimates for new cases of testicular cancer and deaths in the US and what research is currently being done.

- Key Statistics for Testicular Cancer
- What's New in Testicular Cancer Research?

What Is Testicular Cancer?

- What are testicles?
- Types of testicular cancer
- Secondary testicular cancers

Cancer starts when cells begin to grow out of control. Cells in nearly any part of the body can become cancer and spread to other parts of the body. To learn more about how cancers start and spread, see What Is Cancer?[1]

Cancer that starts in the testicles is called testicular cancer. To understand this cancer, it helps to know about the normal structure and function of the testicles.

What are testicles?

Testicles (also called **testes**; a single testicle is called a **testis ; a g /GS2scrotum stgsction of thwS**

Testicles have 2 main functions:

- They make male hormones (androgens) such as testosterone.

- **Classical seminoma:** More than 95% of seminomas are classical. These usually occur in men between 25 and 45.
- **Spermatocytic seminoma:** This rare type of seminoma tends to occur in older men. (The average age is about 65.) Spermatocytic tumors tend to grow more slowly and are less likely to spread to other parts of the body than classical seminomas.

Some seminomas can increase blood levels of a protein called human chorionic gonadotropin (HCG). HCG can be checked with a simple blood test and is considered a tumor marker for certain types of testicular cancer. It can be used for diagnosis and to check how the patient is responding to treatment.

Non-seminomas

These types of germ cell tumors usually occur in men between their late teens and early 30s. The 4 main types of non-seminoma tumors are embryonal carcinoma, yolk sac carcinoma, choriocarcinoma, and teratoma. Most tumors are a mix of different types (sometimes with seminoma cells too), but this doesn’t change the treatment of most non-seminoma cancers.

Embryonal carcinoma: These cells are found in about 40% of testicular tumors, but pure embryonal carcinomas occur only 3% to 4% of the time. When seen under a microscope, these tumors can look like tissues of very early embryos. This type of non-seminoma tends to grow rapidly and spread outside the testicle.

Embryonal carcinoma can increase blood levels of a tumor marker protein called **alpha-fetoprotein** (AFP), as well as **human chorionic gonadotropin** (HCG).

Yolk sac carcinoma: These tumors are so named because their cells look like the yolk sac of an early human embryo. Other names for this cancer include yolk sac tumor, endodermal sinus tumor, infantile embryonal carcinoma, or orchidoblastoma.

This is the most common form of testicular cancer in children (especially in infants), but pure yolk sac carcinomas (tumors that do not have other types of non-seminoma cells in them) are rare in adults. When they occur in children, these tumors usually are treated successfully. But they're of more concern when they occur in adults, especially if they are pure. Yolk sac carcinomas respond very well to chemotherapy , even if they have spread.

This type of tumor almost always increases blood levels of AFP (alpha-fetoprotein).

Choriocarcinoma:

cause symptoms or form a lump that you or the doctor can feel. The only way to diagnose[3] testicular CIS is to have a biopsy . (This is a procedure to take out a tiny bit of tissue so it can be checked under a microscope.) Sometimes CIS is found incidentally (by accident) when a testicular biopsy is done for another reason, such as infertility.

Experts don't agree about the best treatment for CIS. Since CIS doesn't always become an invasive cancer, many doctors in the United States consider observation (watchful waiting) to be the best treatment option.

When CIS of the testicle becomes invasive, its cells are no longer just in the seminiferous tubules, they've grown into other structures of the testicle. These cancer cells can then spread either to the lymph nodes (small, bean-shaped collections of white blood cells) through lymphatic vessels (tiny fluid-filled tubes that connect the lymph nodes), or through the blood to other parts of the body.

Stromal tumors

Tumors can also start in the supportive and hormone-producing tissues, or stroma, of the testicles. These tumors are known as **gonadal stromal tumors**. They make up less than 5% of adult testicular tumors, but up to 20% of childhood testicular tumors. The main types are **Leydig cell tumors** and **Sertoli cell tumors**.

Leydig cell tumors

These tumors start in the Leydig cells in the testicle that normally make male sex hormones (androgens like testosterone). Leydig cell tumors can develop in both adults and children. These tumors often make androgens (male hormones), but sometimes they make estrogens (female sex hormones).

Most Leydig cell tumors are not cancer (benign). They seldom spread beyond the testicle and can often be cured with surgery. Still, a small number of Leydig cell tumors do spread to other parts of the body. These tend to have a poor outlook because they usually don't respond well to chemo or radiation therapy.

Sertoli cell tumors

These tumors start in normal Sertoli cells, which support and nourish the sperm-making germ cells. Like the Leydig cell tumors, these tumors are usually benign. But if they spread, they usually don't respond well to chemo or radiation therapy.

Secondary testicular cancers

Cancers that start in another organ and then spread (metastasize) to the testicle are called secondary testicular cancers. These are not true testicular cancers – they don't start in the testicles. They're named and treated based on where they started.

Lymphoma[4] is the most common secondary testicular cancer. Testicular lymphoma is more common in men older than 50 than primary testicular tumors. The outlook depends on the type and stage of lymphoma. The usual treatment is surgical removal, followed by radiation and/or chemotherapy.

In boys with acute leukemia[5], the leukemia cells can sometimes form a tumor in the testicle. Along with chemotherapy to treat the leukemia, this might require treatment with radiation or surgery to remove the testicle.

Cancers of the prostate, lung, skin (melanoma), kidney, and other organs also can spread to the testicles. The prognosis for these cancers tends to be poor because these cancers have usually spread widely to other organs as well. Treatment depends on the specific type of cancer.

Hyperlinks

1. www.cancer.org/cancer/understanding-cancer/what-is-cancer.html
2. www.cancer.org/cancer/survivorship/long-term-health-concerns/recurrence.html
3. www.cancer.org/cancer/types/testicular-cancer/detection-diagnosis-staging/how-diagnosed.html
4. www.cancer.org/cancer/types/non-hodgkin-lymphoma.html
5. www.cancer.org/cancer/types/leukemia-in-children.html

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National Comprehensive Cancer Network, Clinical Practice Guidelines in Oncology (NCCN Guidelines®), Testicular Cancer, Version 2.2018 -- February 16, 2018.

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Last Revised: May 17, 2018

Key Statistics for Testicular Cancer

The American Cancer Society's estimates for testicular cancer in the United States for 2024 are:

- About 9,760 new cases of testicular cancer diagnosed
- About 500 deaths from testicular cancer

The incidence rate of testicular cancer has been increasing in the US and many other countries for several decades. The increase is mostly in seminomas. Experts have not been able to find reasons for this. Lately, the rate of increase has slowed.

Testicular cancer is not common: about 1 of every 250 males will develop testicular cancer at some point during their lifetime.

The average age of males when first diagnosed with testicular cancer is about 33. This is largely a disease of young and middle-aged men, but about 6% of cases occur in children and teens, and about 8% occur in men older than 55.

Because testicular cancer usually can be treated successfully, a man's lifetime risk of dying from this cancer is very low: about 1 in 5,000 . If you would like to know more about survival statistics, see Testicular cancer survival rates[1].

Visit the American Cancer Society's Cancer Statistics Center[2] for more key statistics.

Hyperlinks

1. www.cancer.org/cancer/types/testicular-cancer/detection-diagnosis-staging/survival-rates.html
2. cancerstatisticscenter.cancer.org/

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American Cancer Society. *Cancer Facts & Figures 2024*. Atlanta: American Cancer Society; 2024.

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SEER Cancer Stat Facts: Testicular cancer . National Cancer Institute. Bethesda, MD, https://seer.cancer.gov/statfacts/html/testis.html. Accessed January 5, 2018.

Last Revised: January 17, 2024

What's New in Testicular Cancer Research?

- Genetics
- Treatment
- Long-term treatment side effects

Important research into testicular cancer is being done in many university hospitals, medical centers, and other institutions around the world. Each year, scientists find out more about what causes the disease, how to prevent it, and how to improve treatment.

Genetics

In recent years, researchers have found that changes in certain genes, such as PLAP, NANOG, SOX2, and REX1, appear to be linked to testicular cancer. These findings could someday help identify men at higher risk, but they need to be studied more.

Scientists are also studying changes in the genes of testicular cancer cells to learn more about the causes of this disease. Their hope is that improved understanding will lead to better treatment. Certain gene mutations found in the testicular cancer cells have been linked to resistance to chemotherapy and predict poor outcomes. These findings may help personalize treatment. They could also help find new drugs to treat testicular cancer, drugs that can target these gene mutations. A better understanding of the genetic changes will also help doctors decide which patients need further treatment and which ones can be safely treated with surgery alone.

Treatment

Clinical trials have refined doctors' approaches to treating these cancers. For example, studies have found factors that help predict which patients have a particularly good prognosis and may not need lymph node surgery or radiation therapy. Studies also have found unfavorable prognostic factors that suggest certain patients may benefit from more intense treatment.from more inteycprm 573.02 Tm 0 0 0 rg hese

others, or lowering doses can reduce side effects for some men without reducing the effectiveness of treatment.

Doctors also want to be able to predict whose cancer is more likely to come back later[2](recur) and then base treatment on this. This way they couldn't under- or over-treat anyone. For instance, one study reported good results by individualizing treatment in men with metastatic cancer based on the decline of tumor marker (AFP and HCG) levels after chemo, giving more intense treatment to those with a slower decline.

Hyperlinks

1. www.cancer.org/cancer/types/testicular-cancer/treating/high-dose-chemo-stem-cell.html
2. www.cancer.org/cancer/survivorship/long-term-health-concerns/recurrence.html

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(https://www.cancer.org/cancer/acs-medical-content-and-news-staff.html)

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