
About Malignant Mesothelioma

Get an overview of malignant mesothelioma and the latest key statistics in the US.

Overview and Types

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

- [What Is Malignant Mesothelioma?](#)

Research and Statistics

See the latest estimates for new cases of malignant mesothelioma in the US and what research is currently being done.

- [Key Statistics About Malignant Mesothelioma](#)
- [What's New in Malignant Mesothelioma Research?](#)

What Is Malignant Mesothelioma?

- [The mesothelium](#)
- [Types of malignant mesothelioma](#)

Malignant mesothelioma is cancer that starts in cells in the linings of certain parts of the

body, most commonly the linings of the chest or abdomen (belly).

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

The mesothelium

A layer of specialized cells called mesothelial cells lines the inside of your chest, your abdomen, and the space around your heart. These cells also cover the outer surface of most of your internal organs. The lining formed by these cells is called the **mesothelium**.

The mesothelium helps protect your organs by making a special lubricating fluid that allows organs to slide against each other. For instance, this fluid makes it easier for your lungs to move (expand and contract) inside your chest when you breathe. The mesothelium has different names in different parts of the body:

- The **pleura** covers the lungs and the space in the chest that contains the lungs.
- The **peritoneum** lines the inside of the abdomen and covers many of the organs in the abdomen.
- The **pericardium** covers the heart and the space that holds the heart in the chest.
- The **tunica vaginalis** lines the testicles.

Types of malignant mesothelioma

Mesothelial tumors can start in any of these linings. These tumors can be cancer (malignant) or not cancer (benign).

A cancer tumor of the mesothelium is called a **malignant mesothelioma**. This is often shortened to just mesothelioma. Mesotheliomas can start in 4 main parts of the body.

- **Pleural mesotheliomas** start in the chest. More than 3 out of 4 mesotheliomas are pleural mesotheliomas.
- **Peritoneal mesotheliomas** start in the abdomen. They make up most of the remaining cases.
- **Pericardial mesotheliomas** start in the covering around the heart and are very rare.

- **Mesotheliomas of the tunica vaginalis** are very rare tumors that start in the covering layer of the testicles.

Malignant mesotheliomas are grouped into 3 main types based on how the cancer cells look:

- More than half of mesotheliomas are **epithelioid**. This type tends to have a better outlook (prognosis) than the other types.
- About 10% to 20% of mesotheliomas are **sarcomatoid (fibrous)**.
- **Mixed (biphasic)** mesotheliomas have both epithelioid and sarcomatoid areas. They make up the remaining 20% to 30% of mesotheliomas.

Hyperlinks

1. www.cancer.org/cancer/understanding-cancer/what-is-cancer.html

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Key Statistics About Malignant Mesothelioma

Mesothelioma is fairly rare in the United States. About 3,000 new cases are diagnosed each year.

The rate of mesotheliomas in the United States increased from the 1970s to the early 1990s, but since then it has leveled off and even gone down slightly. These changes have largely been seen in men, and are probably related to changes in workplace exposures to asbestos. (See [Risk Factors for Malignant Mesothelioma](#)¹) The rate of mesothelioma is lower in women and has been fairly steady for some time. In many other countries, the rate of mesothelioma is still increasing.

Mesothelioma is more common in White, Hispanic, and Latino people than in African Americans or Asian Americans.

Mesotheliomas are much more common in older people than younger people. The average age of people diagnosed with pleural mesothelioma (mesothelioma in the chest) is 72.

Information on survival rates can be found in [Survival Statistics for Malignant Mesothelioma](#)².

Visit the American Cancer Society's [Cancer Statistics Center](#)³ for more key statistics.

Hyperlinks

1. www.cancer.org/cancer/types/malignant-mesothelioma/causes-risks-prevention/risk-factors.html
2. www.cancer.org/cancer/types/malignant-mesothelioma/detection-diagnosis-staging/survival-statistics.html
3. cancerstatisticscenter.cancer.org/

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What's New in Malignant Mesothelioma Research?

- [Causes and prevention](#)
- [Early detection and diagnosis](#)
- [Treatment](#)

There's always research going on in the area of mesothelioma. Scientists are looking for better ways to prevent, diagnose, and treat mesothelioma, as well as find it before it causes problems.

Because mesothelioma is rare, it's been hard to study it well. Most experts agree that treatment in a [clinical trial](#)¹ should be considered for any type or stage of mesothelioma. This way people can get the best treatment available now and may also get the new treatments that are thought to be even better. Most of the new and promising treatments discussed here are only available in clinical trials.

Causes and prevention

The role of [asbestos](#)² in increasing the risk of mesothelioma is a public health concern. Researchers are learning more about which asbestos fibers can cause cancer, how they cause it, and what levels of exposure might be considered safe. Now that the dangers of asbestos are known, we can limit or stop exposure in homes, public buildings, and the workplace. Unfortunately, regulations protecting workers from asbestos exposure are much less stringent in some countries than in others.

Research is looking for genes that might affect a person's risk for mesothelioma.

Early detection and diagnosis

Mesothelioma is easiest to treat and has the best outcomes if it's found early -- when it's small and hasn't spread. Today, it's hard to find it early. Most of the time it's not diagnosed until it's big enough to cause problems and a person goes to a doctor for help. Researchers are looking for early detection tests that might help find mesothelioma before it reaches this point. (Tests to look for cancer in people who don't have symptoms are called *screening tests*.)

Early research on workers exposed to asbestos has found certain protein markers in the blood that have been linked to mesothelioma. The test was able to detect mesothelioma up to a year before it was diagnosed. But more research is needed to figure out if this test is useful. Other studies in at-risk people are looking at tests that can be done on the fluid that's removed from around the lungs and breath tests. All of these could one day lead to screening tests, as well as tests that could be used to diagnose this cancer.

And, as has been learned with other kinds of cancer, identifying and studying mesothelioma-specific biomarkers could even impact treatment choices and give a better understanding of the likely outcome for each patient. Biomarker levels might also prove to be a way to see if and how well treatment is working.

Treatment

Mesothelioma is difficult to treat, and doctors are constantly trying to improve treatment approaches. The exact roles of [surgery](#)³, [radiation therapy](#)⁴, and [chemotherapy](#)⁵ in the treatment of mesothelioma are being studied. Combinations of these treatments are now being tested and may provide the most promising option for some patients. And newer types of treatment that are being tested in clinical trials may give patients and their doctors even more options.

Chemotherapy

Some chemotherapy drugs can shrink or slow the growth of mesotheliomas, but in most cases the effects last for a limited time. Studies are underway to test new chemotherapy drugs and new combinations of drugs.

Photodynamic therapy

Another technique now being studied is photodynamic therapy (PDT). For this treatment, a light-activated drug is injected into a vein. The drug spreads throughout the body, but it tends to collect in cancer cells. A few days later (usually in the operating

room, just after surgery), a tube with a special light on the end is put into the chest. The light causes a chemical change that "turns on" the drug so it kills the cancer cells. Since the drug is only active in the areas exposed to the light, PDT might cause fewer side effects than using drugs that spread throughout the body. Several [clinical trials](#)⁶ are now studying the use of PDT for mesothelioma.

To find out more, see [Photodynamic Therapy](#)⁷.

Targeted therapy

Chemo drugs tend to have a limited effect against mesothelioma. In recent years, researchers have learned more about the gene and protein changes in mesothelioma cells that are not found in normal cells. This has led to the development of targeted therapy drugs. These drugs target the changes that make cancer cells different from normal, healthy cells. Some of these types of drugs are [just coming into use for mesothelioma](#)⁸, and many others are now being studied. For example, some new drugs target mesothelin, a protein found in high levels in mesothelioma cells.

Targeted therapy drugs work differently from standard chemo drugs. They sometimes work when chemo drugs don't, and they often have different (and less severe) side effects.

To learn more, see [Targeted Therapy](#)⁹.

Immunotherapy

Clinical trials are looking at the value of [immunotherapy](#)¹⁰ for mesothelioma. These drugs help the body's immune system to attack the cancer cells.

Small studies have suggested this treatment works, but more research is needed. Researchers are looking at how to best combine immunotherapy drugs and how to get the best results when combining them with chemotherapy and other treatments. They're also looking for new immunotherapy drugs to treat mesothelioma.

To learn more, see [Cancer Immunotherapy](#)¹¹.

Alternating electric fields (tumor treating fields)

Researchers have found that exposing some types of cancer cells to alternating electric fields (also known as tumor treating fields, or TTF) can slow or even stop their growth. A portable device that generates such electric fields, known as **NovoTTF-100L**, is now an

option along with chemotherapy to help treat some pleural mesotheliomas that can't be treated with surgery, although it's not yet clear if the device can help people live longer.

For this treatment, the chest and/or back is shaved (if needed), and sets of electrodes are placed on the skin. The electrodes are attached to a battery pack (kept in a backpack) and are worn for most of the day. They generate mild electric currents that are thought to affect tumor cells more than normal cells.

Side effects of the device tend to be minor, and can include skin irritation at the electrode sites.

Other newer forms of treatment

Because standard treatments often have limited usefulness against mesothelioma, researchers are studying other new types of treatment as well. These are very early studies, and a lot more research is needed before they'll be widely available.

Gene therapy: A newer type of treatment being tested on mesothelioma is gene therapy, which attempts to add new genes to cancer cells to make them easier to kill. One approach to gene therapy uses special viruses that have been modified in the lab. The virus is injected into the pleural space and infects the mesothelioma cells. When this infection occurs, the virus injects the desired gene into the cells. In one version of this approach, the virus carries a gene that helps turn on the immune system to attack the cancer cells.

Vaccine therapy: Other new treatments called [cancer vaccines](#)¹² are also aimed at getting the immune system to attack the cancer. In one approach, immune cells are removed from a patient's blood and treated in the lab to get them to react to tumor cells. The immune cells are then given back to the patient, where it is hoped they will cause the body's immune system to attack the cancer. Other vaccines being tested carry certain proteins to the cancer cells to keep them from growing. This is a promising cancer treatment, and a lot of different types of vaccines are being studied.

Hyperlinks

1. www.cancer.org/cancer/managing-cancer/making-treatment-decisions/clinical-trials.html
2. www.cancer.org/cancer/risk-prevention/chemicals/agent-orange-and-cancer.html

3. www.cancer.org/cancer/types/malignant-mesothelioma/treating/surgery.html
4. www.cancer.org/cancer/types/malignant-mesothelioma/treating/radiation.html
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11. www.cancer.org/cancer/managing-cancer/treatment-types/immunotherapy.html
12. www.cancer.org/cancer/managing-cancer/treatment-types/immunotherapy/cancer-vaccines.html

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