



# About Malignant Mesothelioma

## Overview and Types

If you have 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.

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

# What Is Malignant Mesothelioma?

Malignant mesothelioma is a cancer that starts in cells in the linings of certain parts of the body, especially in the linings of the chest or abdomen.

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?](#)

## The mesothelium

A layer of specialized cells called *mesothelial cells* lines the inside of the chest, the 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 move against each other. For example, this fluid makes it easier for your lungs to move (expand and contract) inside the chest when you breathe. The mesothelium has different names in different parts of the body:

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

Mesothelial tumors can start in any of these linings. These tumors can be non-cancerous (benign) or cancerous (malignant).

## Malignant mesothelioma

A cancerous tumor of the mesothelium is called a *malignant mesothelioma*, although this is often shortened to just mesothelioma. Mesotheliomas can start in 4 main areas in the body.

- **Pleural mesotheliomas** start in the chest. About 3 out of 4 mesotheliomas are pleural mesotheliomas.
- **Peritoneal mesotheliomas** begin 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 can also be classified into 3 main types based on how the cancer cells are arranged:

- About half of mesotheliomas are **epithelioid**. This type tends to have a better outlook (prognosis) than the other types.
- About 10% of mesotheliomas are **sarcomatoid (fibrous)**.
- **Mixed (biphasic)** mesotheliomas have both epithelioid and sarcomatoid areas. They make up the remaining 30% to 40% of mesotheliomas.

## Benign tumors of the mesothelium

Benign (non-cancerous) tumors can also start in the mesothelium. These tumors are typically removed by surgery, and there is often no need for additional treatment.

### **Localized fibrous tumor of the pleura**

This type of benign tumor can form in the pleura surrounding the lungs. It used to be called *benign fibrous mesothelioma*, but doctors now know that this tumor actually does not start in mesothelial cells. This disease is usually benign, but about 1 in 10 are cancerous. A similar condition that starts in the peritoneum is called *solitary fibrous tumor of the peritoneum*.

### **Adenomatoid mesothelioma**

This benign tumor can develop in the mesothelium of certain reproductive organs. In men, it often starts in the epididymis (ducts that carry sperm cells out of the testicle). In women, this tumor can begin in the fallopian tubes (tubes that carry eggs from the ovaries to the uterus).

### **Benign cystic mesothelioma**

This rare non-cancerous tumor often begins in the peritoneum.

**Only malignant mesothelioma will be discussed further in this document.**

- [References](#)

[See all references for Malignant Mesothelioma](#)

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## **What Are the Key Statistics About Malignant Mesothelioma?**

Mesothelioma is fairly rare in the United States, with about 3,000 new cases being

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 over time in workplace exposures to asbestos. (See [What Are the Risk Factors for Malignant Mesothelioma?](#)) 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 whites and Hispanics/Latinos than in African Americans or Asian Americans.

Mesotheliomas are much more common in older people than younger people. The average age at the time of diagnosis for pleural mesothelioma (mesothelioma in the chest) is 69.

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

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

- [References](#)

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## What's New in Malignant Mesothelioma Research and Treatment?

There is always research going on in the area of mesothelioma. Scientists are looking for better ways to prevent, diagnose, and treat mesothelioma. Despite recent progress, much remains to be learned about the best way to treat these cancers.

### Causes and prevention

Some research is focused on learning exactly how asbestos changes mesothelial cells and their DNA to cause these cancers. Understanding how these fibers produce cancer might help us develop ways to prevent those changes.

The role of asbestos in increasing the risk of mesothelioma is a definite 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 also under way to clarify the role (if any) of SV40, a virus that has been linked to mesothelioma in some studies.

## Treatment

Mesothelioma remains a difficult cancer to treat, and doctors are constantly trying to improve on current approaches. The exact roles of [surgery](#), [radiation therapy](#), and [chemotherapy](#) in the treatment of mesothelioma are still being studied. Combinations of these treatments are now being tested and may provide the most promising option for some patients. Newer types of treatment now being studied 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 newer chemotherapy 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 and tends to collect in cancer cells. A few days later (usually in the operating room, just after surgery), a special red light on the end of a tube is placed into the chest. The light causes a chemical change that activates the drug and kills the cancer cells. Since the drug is only active in the areas exposed to the special light, this approach might cause fewer side effects than using drugs that spread throughout the body. Several [clinical trials](#) are now studying the use of PDT for mesothelioma. To find out more about PDT, see [Photodynamic Therapy](#).

## Targeted drugs

In general, chemo drugs have a limited effect against mesothelioma. As researchers have learned more about the changes in cells that cause cancer, they have developed newer drugs that target these changes. Targeted 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.

Sunitinib (Sutent) is an example of a targeted drug that has shown promise in some studies.

Other new drugs have different targets. For example, some new drugs target mesothelin, a protein found in high levels in mesothelioma cells. To learn more about targeted therapy drugs, see [Targeted Therapy](#).

## Other newer forms of treatment

Because standard treatments often have limited usefulness against mesothelioma, researchers are studying other new types of treatment as well.

**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. Early studies of this approach have found it may shrink or slow the growth of mesothelioma in some people, but more research is needed to confirm this.

**Immunotherapy:** Other new treatments called *cancer vaccines* 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 as blood transfusions, where it is hoped they will cause the body's immune system to attack the cancer. This approach is now being studied in [clinical trials](#).

Another form of immunotherapy being studied is a drug called tremelimumab, which targets a certain immune cells and takes the brakes off the immune system.

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

**Virus therapies:** Researchers are also studying the use of specially designed viruses to treat mesothelioma. These viruses can be put into the pleural space, where the hope is that they can either infect and kill the cancer cells directly, or cause the immune system to attack the cancer cells. These approaches are still in the early phases of clinical trials.

- [References](#)

[See all references for Malignant Mesothelioma](#)

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