

A BRIEF PRESENTATION ON MESOTHELIOMA

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Overview

- Malignant mesothelioma (me-zoe-thee-lee-O-muh) is a type of cancer that occurs in the thin layer of tissue that covers the majority of your internal organs (mesothelium).
- Mesothelioma is an aggressive and deadly form of cancer. Mesothelioma treatments are available, but for many people with mesothelioma, a cure isn't possible.
- Doctors divide mesothelioma into different types based on what part of the mesothelium is affected. Mesothelioma most often affects the tissue that surrounds the lungs (pleura). This type is called pleural mesothelioma. Other, rarer types of mesothelioma affect tissue in the abdomen (peritoneal mesothelioma), around the heart and around the testicles.

Symptoms

- Signs and symptoms of mesothelioma vary depending on where the cancer occurs.
- **Pleural mesothelioma**, which affects the tissue that surrounds the lungs, causes signs and symptoms that may include:
 - Chest pain
 - Painful coughing
 - Shortness of breath
 - Unusual lumps of tissue under the skin on your chest
 - Unexplained weight loss
- **Peritoneal mesothelioma**, which occurs in tissue in the abdomen, causes signs and symptoms that may include:
 - Abdominal pain
 - Abdominal swelling
 - Nausea
 - Unexplained weight loss
- **Other forms of mesothelioma**
 - Signs and symptoms of other types of mesothelioma are unclear, since these forms of the disease are very rare.
 - Pericardial mesothelioma, which affects tissue that surrounds the heart, can cause signs and symptoms such as breathing difficulty and chest pains.
 - Mesothelioma of tunica vaginalis, which affects tissue surrounding the testicles, may be first detected as swelling or a mass on a testicle.
- **When to see a doctor**
 - See your doctor if you have signs and symptoms that worry you. Signs and symptoms of mesothelioma aren't specific to this disease and, due to the rarity of mesothelioma, are more likely to be related to other conditions. If any persistent signs and symptoms seem unusual or bothersome, ask your doctor to evaluate them. Tell your doctor if you've been exposed to asbestos.

Causes

- In general, cancer begins when a series of changes (mutations) happens in a cell's DNA. The DNA contains the instructions that tell a cell what to do. The mutations tell the cell to grow and multiply out of control. The abnormal cells accumulate and form a tumor.
- It isn't clear what causes the initial genetic mutations that lead to mesothelioma, though researchers have identified factors that may increase the risk. It's likely that cancers form because of an interaction between many factors, such as inherited conditions, your environment, your health conditions and your lifestyle choices.
- Risk factors
 - **Asbestos exposure: The primary risk factor for mesothelioma**
 - Most mesotheliomas are thought to be related to asbestos exposure. Asbestos is a mineral that's found naturally in the environment. Asbestos fibers are strong and resistant to heat, making them useful in a wide variety of applications, such as in insulation, brakes, shingles, flooring and many other products.
 - When asbestos is broken up, such as during the mining process or when removing asbestos insulation, dust may be created. If the dust is inhaled or swallowed, the asbestos fibers will settle in the lungs or in the stomach, where they can cause irritation that may lead to mesothelioma. Exactly how this happens isn't understood. It can take 20 to 60 years or more for mesothelioma to develop after asbestos exposure.
 - Most people with asbestos exposure never develop mesothelioma. This indicates that other factors may be involved in determining whether someone gets mesothelioma. For instance, you could inherit a predisposition to cancer or some other condition could increase your risk.

Factors that may increase the risk of mesothelioma include:

- **Personal history of asbestos exposure.** If you've been directly exposed to asbestos fibers at work or at home, your risk of mesothelioma is greatly increased.
- **Living with someone who works with asbestos.** People who are exposed to asbestos may carry the fibers home on their skin and clothing. Exposure to these stray fibers over many years can put others in the home at risk of mesothelioma. People who work with high levels of asbestos can reduce the risk of bringing home asbestos fibers by showering and changing clothes before leaving work.
- **A family history of mesothelioma.** If your parent, sibling or child has mesothelioma, you may have an increased risk of this disease.
- **Radiation therapy to the chest.** If you had radiation therapy for cancer in your chest, you might have an increased risk of mesothelioma.

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- Complications
- As pleural mesothelioma spreads in the chest, it puts pressure on the structures in that area. This can cause complications, such as:
 - Difficulty breathing
 - Chest pain
 - Difficulty swallowing
 - Pain caused by pressure on the nerves and spinal cord
 - Accumulation of fluid in the chest (pleural effusion), which can compress the lung nearby and make breathing difficult

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- Prevention
- Reducing your exposure to asbestos may lower your risk of mesothelioma.
- **Find out whether you work with asbestos**
- Most people with mesothelioma were exposed to the asbestos fibers at work. Workers who may encounter asbestos fibers include:
 - Asbestos miners
 - Electricians
 - Plumbers
 - Pipefitters
 - Insulators
 - Shipyard workers
 - Demolition workers
 - Brake mechanics
 - Selected military personnel
 - Home remodelers

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- **Follow your employer's safety regulations**
- Follow all safety precautions in your workplace, such as wearing protective equipment. You may also be required to shower and change out of your work clothes before taking a lunch break or going home. Talk to your doctor about other precautions you can take to protect yourself from asbestos exposure.
- **Be safe around asbestos in your home**
- Older homes and buildings may contain asbestos. In many cases, it's more dangerous to remove the asbestos than it is to leave it intact. Breaking up asbestos may cause fibers to become airborne, where they can be inhaled. Consult experts trained to detect asbestos in your home. These experts may test the air in your home to determine whether the asbestos is a risk to your health. Don't attempt to remove asbestos from your home — hire a qualified expert.

Diagnosis

- If you have signs and symptoms that might indicate mesothelioma, your doctor will conduct a physical exam to check for any lumps or other unusual signs.
- Your doctor may order imaging scans, such as a chest X-ray and a computerized tomography (CT) scan of your chest or abdomen, to look for abnormalities.
- Based on the findings, you may undergo further testing to determine whether mesothelioma or another disease is causing your symptoms.
- **Biopsy**
- Biopsy, a procedure to remove a small portion of tissue for laboratory examination, is the only way to determine whether you have mesothelioma. Depending on what area of your body is affected, your doctor selects the right biopsy procedure for you.
- Options include:
- **Inserting a needle through the skin.** The doctor might remove fluid or a piece of tissue with a thin needle inserted through the skin on your chest or abdomen.
- **Collecting a sample of tissue during surgery.** A fluid or tissue sample might be collected during an operation. The surgeon might make a small incision and insert a tube with a video camera to see inside your chest or abdomen. Special tools can be passed through the tube to collect a tissue sample.

The tissue sample is analyzed under a microscope to see whether the abnormal tissue is mesothelioma and what types of cells are involved. The type of mesothelioma you have determines your treatment plan.

Determining the extent of the cancer

Once your mesothelioma is confirmed, your doctor may recommend additional tests to understand whether your cancer has spread to your lymph nodes or to other areas of your body.

Tests may include:

CT scans of the chest and abdomen

Magnetic resonance imaging (MRI)

Positron emission tomography (PET)

Your doctor determines which tests are appropriate for you. Not every person needs every test.

Your doctor uses the information from these tests to assign your cancer a stage. The stages of pleural mesothelioma are indicated using Roman numerals ranging from I to IV. A lower numeral means the cancer is more likely to be localized to the area around the lungs and the highest numeral means the cancer has spread to other areas of the body.

The cancer staging system continues to evolve and is becoming more complex as doctors improve cancer diagnosis and treatment. Your doctor uses your cancer stage to select the treatments that are right for you. Formal stages aren't available for other types of mesothelioma.

More Information

[Mesothelioma care at Mayo Clinic](#)

[Chest X-rays](#)

[CT scan](#)

Treatment

- What treatment you undergo for mesothelioma depends on your health and certain aspects of your cancer, such as its stage and location.
- Unfortunately, mesothelioma often is an aggressive disease and for most people a cure isn't possible. Mesothelioma is usually diagnosed at an advanced stage — when it isn't possible to remove the cancer through an operation. Instead, your doctor may work to control your cancer to make you more comfortable.
- Discuss treatment goals with your doctor. Some people want to do everything they can to treat their cancer, even if that means enduring side effects for a small chance of an improvement. Others prefer treatments that make them comfortable so that they can live their remaining time as symptom-free as possible.
- **Surgery**
- Surgeons work to remove mesothelioma when it's diagnosed at an early stage. In some cases this may cure the cancer.
- Most of the time, it isn't possible to remove all of the cancer. In this situation, surgery may help to reduce the signs and symptoms caused by mesothelioma spreading in your body.
- Surgical options may include:
- **Surgery to decrease fluid buildup.** Pleural mesothelioma may cause fluid to build up in your chest, causing difficulty breathing. Surgeons insert a tube or catheter into your chest to drain the fluid. Doctors may also inject medicine into your chest to prevent fluid from returning (pleurodesis).
- **Surgery to remove the tissue around the lungs.** Surgeons may remove the tissue lining the ribs and the lungs (pleurectomy). This procedure won't cure mesothelioma, but may relieve signs and symptoms.
- **Surgery to remove a lung and the surrounding tissue.** Removing the affected lung and the tissue that surrounds it may relieve signs and symptoms of pleural mesothelioma. If you'll be receiving radiation therapy to the chest after surgery, this procedure also allows doctors to use higher doses, since they won't need to worry about protecting your lung from damaging radiation.
- **Surgery for peritoneal mesothelioma.** Peritoneal mesothelioma is sometimes treated with surgery to remove as much of the cancer as possible. Chemotherapy may be used before or after surgery.

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- **Chemotherapy**

- Chemotherapy uses chemicals to kill cancer cells. Systemic chemotherapy travels throughout the body and may shrink or slow the growth of a mesothelioma that can't be removed using surgery. Chemotherapy may also be used before surgery (neoadjuvant chemotherapy) to make an operation easier or after surgery (adjuvant chemotherapy) to reduce the chance that cancer will return.
- Chemotherapy drugs may also be heated and administered directly into the abdominal cavity (intraperitoneal chemotherapy), in the case of peritoneal mesothelioma.

- **Radiation therapy**

- Radiation therapy focuses high-energy beams from sources such as X-rays and protons to a specific spot or spots on your body. Radiation may be used after surgery to kill any remaining cancer cells. It may also help reduce signs and symptoms of advanced cancer in situations where surgery isn't an option.

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- **Other treatments**
- In certain situations, other treatments might be used to treat mesothelioma. Other treatments include:
- **Immunotherapy.** Immunotherapy uses your immune system to fight cancer. Your body's disease-fighting immune system may not attack your cancer because the cancer cells produce proteins that blind the immune system cells. Immunotherapy works by interfering with that process. This treatment might be an option if other treatments aren't working.
- **Targeted therapy.** Targeted therapy uses drugs that attack specific vulnerabilities in cancer cells. These drugs aren't commonly used for treating mesothelioma, but your doctor might recommend targeted therapy based on the results of tumor DNA testing.
- **Clinical trials**
- Clinical trials are studies of new mesothelioma treatment methods. People with mesothelioma may opt for a clinical trial for a chance to try new types of treatment. However, a cure isn't guaranteed. Carefully consider your treatment options and talk to your doctor about what clinical trials are open to you. Your participation in a clinical trial may help doctors better understand how to treat mesothelioma in the future.
- Clinical trials are currently investigating a number of new approaches to mesothelioma treatment, including new targeted therapy drugs and new approaches to immunotherapy.

- **Treatment for other types of mesothelioma**
- Pericardial mesothelioma and mesothelioma of tunica vaginalis are very rare. Early-stage cancer may be removed through surgery. Doctors have yet to determine the best way to treat later-stage cancers, though. Your doctor may recommend other treatments to improve your quality of life.
- Clinical trials
- [Explore Mayo Clinic studies](#) testing new treatments, interventions and tests as a means to prevent, detect, treat or manage this disease.
- Alternative medicine
- No alternative medicine treatments have proved helpful in treating mesothelioma. But complementary and alternative treatments may help control mesothelioma signs and symptoms. Discuss options with your doctor.
- Mesothelioma can cause pressure within your chest that can make you feel as if you're always short of breath. Breathlessness can be distressing. Your doctor may recommend using supplemental oxygen or taking medications to make you more comfortable, but often these aren't enough. Combining your doctor's recommended treatments with complementary and alternative approaches may help you feel better.

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- Alternative treatments that have shown some promise in helping people cope with breathlessness include:
- **Acupuncture.** Acupuncture uses thin needles inserted at precise points into your skin.
- **Breath training.** A nurse or physical therapist can teach you breathing techniques to use when you feel breathless. Sometimes you may feel breathless and begin to panic. Using these techniques may help you feel more in control of your breathing.
- **Relaxation exercises.** Slowly tensing and relaxing different muscle groups may help you feel more at ease and breathe easier. Your doctor may refer you to a therapist who can teach you relaxation exercises so that you can do them on your own.
- **Sitting near a fan.** Directing a fan to your face may help ease the sensation of breathlessness.

- Coping and support
- A diagnosis of mesothelioma can be devastating not only to you but also to your family and friends. In order to regain a sense of control, try to:
- **Learn enough about mesothelioma to make decisions about your care.** Write down questions to ask your doctor. Ask your health care team for information to help you better understand your disease. Good places to start looking for more information include the National Cancer Institute, the American Cancer Society and the Mesothelioma Applied Research Foundation.
- **Surround yourself with a support network.** Close friends or family can help you with everyday tasks, such as getting you to appointments or treatment. If you have trouble asking for help, learn to be honest with yourself and accept help when you need it.
- **Seek out other people with cancer.** Ask your health care team about cancer support groups in your community. Sometimes there are questions that can only be answered by other people with cancer. Support groups offer a chance to ask these questions and receive support from people who understand your situation. Online support message boards, such as the American Cancer Society's Cancer Survivors Network, can offer similar benefits while allowing you to remain anonymous.
- **Plan ahead.** Ask your health care team about advance directives that give your family guidance on your medical wishes in case you can no longer speak for yourself.

**Thank
You**

