

# Understanding Pleural Mesothelioma

## Information for patients and families

Read this booklet to learn about:

- What is pleural mesothelioma?
- What causes it?
- What are the symptoms?
- What tests are done to diagnose it?
- What are the treatments?
- What questions should I ask my doctor?



## What is pleural mesothelioma?

Pleural mesothelioma is cancer of the cells in the lining of the lung. These cells are called mesothelial cells.

## What is the mesothelium?

The mesothelium is a lining that covers most of your internal body organs and is part of the lining of the **pleura**. The pleura are the two layers of tissue that protect the lungs. The pleura are made of two layers:

1. **Visceral layer.** The inner layer that wraps around the surface of the lungs. Outside of the chest, a similar visceral layer of mesothelium covers the abdominal organs, such as the stomach.
2. **Parietal layer.** The outer layer that lines the inner chest wall and the diaphragm. The space between the two layers is filled with **pleural fluid**. This fluid allows the layers to slide over each other so that you can breathe.

The mesothelium has different names, depending on where it is in the body.

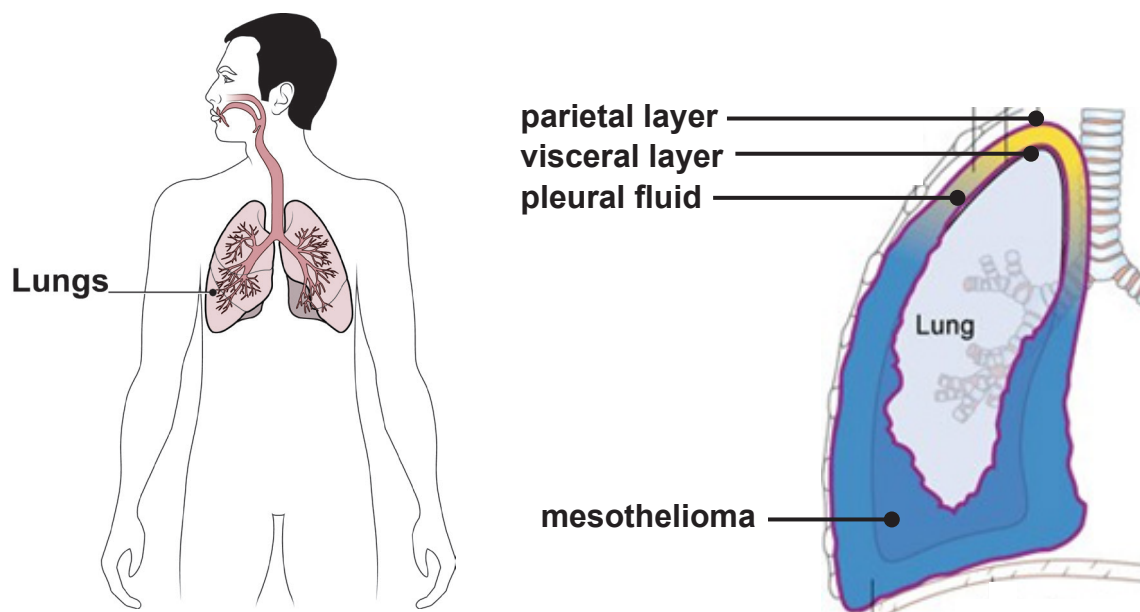


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## **How does pleural mesothelioma develop?**

Pleural mesothelioma starts when normal cells from the lining of the lung begin to change. The cells become cancerous and continue to grow. As the cancer cells grow out of control, the pleural tissue thickens and presses on the lung.

Sometimes the cancer cells make extra fluid that collects between the two layers of the pleura. This is called a **pleural effusion**. Changes to the pleura or a pleural effusion can make you feel short of breath.

In the chest, the lungs and heart are close together. In some people, pleural mesothelioma can spread into the **pericardium**, the layer of tissue covering the heart.

## **What causes mesothelioma?**

There is a strong link between mesothelioma and being exposed to asbestos. Asbestos is a mineral rock made up of tiny fibres. It is widely used in building materials and industry.

Asbestos fibres are very fine. If you breathe them in, they can end up in the smallest airways of the lungs. These asbestos fibres can also make their way through the lung tissue and settle in the pleura causing changes at the genetic level of the healthy cells. These changes can turn healthy cells into cancerous cells.

Mesothelioma may only develop many years after being exposed to asbestos (20 to 40 years later). Some people with mesothelioma do not know where or when they were exposed.

## **Is there a way to screen for it?**

Screening is testing people for a disease before they have any signs or symptoms. At the moment, there are no reliable screening tests for mesothelioma.

## What are the symptoms of mesothelioma?

In the early stages of mesothelioma, there may be no symptoms. Symptoms appear as the cancer grows. General symptoms may include unplanned weight loss, night sweats, fatigue, chest pain and shortness of breath.

<b>Other symptoms of pleural mesothelioma are:</b>	
<b>breathing problems</b>	<ul style="list-style-type: none"><li>• shortness of breath</li><li>• wheezing noises</li></ul>
<b>cough</b>	<ul style="list-style-type: none"><li>• gets worse or does not go away</li></ul>
<b>pain</b>	<ul style="list-style-type: none"><li>• lower back</li><li>• shoulder</li><li>• ribs</li><li>• side of your chest</li></ul>
<b>trouble swallowing</b>	
<b>changes to your voice</b>	<ul style="list-style-type: none"><li>• sounding raspy</li><li>• strained</li><li>• changes in volume</li></ul>

## How do I know if I have mesothelioma?

Mesothelioma can be hard to diagnose. You may have had several tests already. At your visit to the hospital, we will:

- take your medical history
- do a physical exam
- arrange special tests to confirm the diagnosis

After we get the results, we may need to repeat some tests or do other tests. This is important so you can get the right treatment.

## What are the tests for mesothelioma?

Type of test	What can I expect?
Blood tests	You may need to have blood tests to check your overall health.
CT Scan	<p>This special scan uses x-rays to take pictures of the inside of your body.</p> <p>You will get a CT scan of your chest which can show:</p> <ul style="list-style-type: none"><li>• any fluid or swelling</li><li>• the size and position of the mesothelioma</li><li>• if the cancer has spread to the lymph nodes, the chest wall or other organs</li></ul> <p>Before the scan, you may get an injection of dye called '<b>contrast</b>'. This makes the scan clearer to read. Sometimes people can have an allergic reaction to the contrast dye. Let your doctor know if you have a reaction.</p>
Thoracentesis or Pleural Aspiration (fluid drainage)	<p>Fluid can build up in the chest because cancer cells make the pleura inflamed. To drain the fluid from your chest:</p> <ul style="list-style-type: none"><li>• A small tube (called a catheter) is put into the pleural space.</li><li>• A drainage bag is attached to the end of the tube. This allows the fluid to drain and be collected.</li><li>• Then a sample of the fluid is sent to a lab to see if it contains cancer cells.</li></ul>

Type of test	What can I expect?
<b>Biopsy</b>	<p data-bbox="553 331 1382 464">A biopsy removes a small piece of tissue. Then the tissue is sent to a lab for testing. This will either confirm or rule out a diagnosis of mesothelioma.</p> <p data-bbox="553 522 1289 558">There are a few ways the biopsy can be done.</p> <hr data-bbox="553 600 1409 604"/> <p data-bbox="553 646 797 682"><b>Needle Biopsy</b></p> <p data-bbox="553 707 1357 837">A needle biopsy may be done using another CT scan. This helps to see exactly where to collect the sample.</p> <ul data-bbox="589 863 1382 1194" style="list-style-type: none"> <li data-bbox="589 863 1382 993">• First you get a local anesthetic to numb the area where they are going to put the biopsy needle.</li> <li data-bbox="589 1018 1382 1194">• Then a fine needle is put through the skin to take out a small piece of tissue. This should not be painful, but you may feel pressure when the needle goes in.</li> </ul> <hr data-bbox="553 1236 1409 1241"/> <p data-bbox="553 1287 764 1323"><b>Pleuroscopy</b></p> <p data-bbox="553 1348 1284 1383">This is a procedure under general anesthetic.</p> <ul data-bbox="589 1409 1349 1749" style="list-style-type: none"> <li data-bbox="589 1409 1349 1493">• First, small cuts (incisions) are made into the skin of your chest.</li> <li data-bbox="589 1518 1349 1648">• Then a flexible light and camera are inserted. This allows the doctor to look at the lining of your chest wall and lungs.</li> <li data-bbox="589 1673 1349 1749">• Then the doctor will use small forceps to remove a sample of the pleura.</li> </ul>

## **Why is it hard to diagnose mesothelioma?**

Mesothelioma can be hard to diagnose. This is because there are different types of mesothelioma cells in a tumour. They can look like other types of cancer cells. Also it is difficult to tell the difference between mesothelioma and benign pleural disease.

Mesothelioma cells can be grouped into 3 types.

This depends on how the cells look under the microscope:

1. epithelioid
2. sarcomatoid or fibrous
3. biphasic or mixed type, made up of epithelioid and sarcomatoid cells

## **If you have mesothelioma**

The next step is to find out what stage of mesothelioma you have.

## **What are the stages?**

The stage is a way to describe the cancer. The stage can tell you:

- where the cancer is
- if or where it has spread
- if it is affecting other organs in the body

There are 4 stages of pleural mesothelioma (Stages 1 to Stage 4). The higher the number, the further the cancer has spread out into your body. Your doctor will use the stage of your cancer to decide which treatment is best for you.

## **What tests are used for this?**

To find out what stage of mesothelioma you have, you may need one or more of these tests.

### **Endobronchial Ultrasound (EBUS)**

You may have this test if the lymph nodes around your lung are enlarged. First you will get medicine to make you drowsy or sedated. The doctor passes a small tube into your mouth, and down the windpipe. Then it passes into the smaller airway passages. It uses ultrasound to take pictures of the lung, pleura and nearby lymph glands. The doctor may do a biopsy of any enlarged lymph nodes at the same time.

### **Mediastinoscopy**

You may have this test if the lymph nodes around your lung are enlarged. This is a minor operation. It is done while you are asleep under a general anesthetic. The doctor makes a small cut about 4 centimetres (2 inches) long at the base of your neck. Then the doctor passes a small tube through the cut to check the tissue there. Next, the doctor takes small samples of tissue. This is called a lymph node biopsy.

### **PET Scan**

PET scan is a type of test that takes pictures of the inside of your body. It uses a small amount of a radioactive sugar. This helps find out if the cancer has spread in the body.

### **MRI of the Brain**

MRI is a type of test that uses a magnetic field and a computer to take detailed pictures. It shows if the mesothelioma has spread to the brain.



## What are the treatments for mesothelioma?

Mesothelioma is very difficult to treat. It is often not diagnosed until it is at an advanced stage. It is also hard to predict how it will grow.

There are 2 main goals of treatment. The first is to control symptoms. The second is to control the spread of the mesothelioma for as long as possible.

The best treatment for you depends on:

- the stage of your cancer
- other medical conditions you may have
- your general level of fitness

The main treatments are:

- chemotherapy
- radiation
- surgery

You may need a combination of treatments to get the best effects possible.

Type of treatment	What can I expect?
<b>Chemotherapy</b>	<ul style="list-style-type: none"><li>• Uses powerful drugs to destroy cancer cells so that they cannot grow or spread to other areas in the body</li></ul>
<b>Radiation therapy</b>	<ul style="list-style-type: none"><li>• A beam of radiation is aimed at the cancer cells</li><li>• Radiation damages all cells in the path of the beam</li><li>• It damages both healthy cells and cancer</li></ul>
<b>Surgery</b>	<ul style="list-style-type: none"><li>• May be possible if you are at an early stage</li><li>• You may also need radiation or chemotherapy before or after surgery</li></ul>

If the mesothelioma is more advanced, chemotherapy and radiation can help to control symptoms such as pain. You may get one of these treatments or both to help with these symptoms.

## **What are the different types of surgery?**

Surgery is not right for everyone. It is usually part of a plan that includes radiation or chemotherapy and sometimes both.

There are 2 surgeries for pleural mesothelioma.

1. Extrapleural pneumonectomy (EPP)
2. Pleurectomy / Decortication

### **Extrapleural pneumonectomy (EPP)**

This surgery removes the whole lung on the side where the mesothelioma is growing. It removes:

- the lung
- the pleura
- possibly the diaphragm
- possibly the pericardium (the covering of the heart)

To be considered for this surgery:

- your mesothelioma must be at an early stage
- it must not have spread to the lymph nodes
- it cannot be growing into areas that are outside the lung
- you must have a good level of fitness

People having an EPP often have radiation before surgery. This is part of a clinical trial at The University Health Network called Surgery for Mesothelioma After Radiation Therapy (SMART) protocol. The clinical trial is a study to explore new ways to treat this cancer.

## Pleurectomy / Decortication

This surgery has two parts:

**Part 1 – Pleurectomy.** This surgery removes the pleura and pericardium on the side where the mesothelioma is growing.

**Part 2 – Decortication.** The surgeon will also take away as much of the mesothelioma tumour from the lung as possible.

This surgery can:

- help control symptoms
- help to control the buildup of fluid in your chest
- reduce chest pain for some people

### What if these treatments are not right for me?

Mesothelioma is often not found until it is at an advanced stage. Your body may not be strong enough to cope with chemotherapy, radiation or surgery.

You can still receive care to help you. Supportive or palliative care can help to relieve symptoms such as pain, breathing problems and weight loss.

### What questions should I ask my doctor?

It is important to talk to your health care team and ask questions. This will help you make decisions about your health care. Make a list of questions before you meet.



#### Here are some examples of questions you can ask:

What type of mesothelioma do I have?

What stage is the mesothelioma cancer?

Has it spread to my lymph nodes or anywhere else?

Can you explain my options for treatment?

How will this treatment help me?

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