

## What is mesothelioma?

Mesothelioma (also called malignant mesothelioma) occurs when abnormal cells in the tissue that surrounds the lungs grow in an uncontrolled way.

The lungs are covered by a double layer of tissue called the pleura, which protects and cushions the lungs. The pleura is made up of layer of cells called mesothelium (or mesothelial cells) and connective tissue. Mesothelium also covers the outer surface of most of the body's other internal organs, including the organs of the abdomen, the heart and the testicles. It makes a lubricating fluid that helps the organs move against each other.

Mesothelioma starts in the mesothelium. About three-quarters of mesotheliomas are in the tissue surrounding the lungs. This is not the same as lung cancer, which starts inside the lungs.

This information relates mainly to pleural mesothelioma (in the lining of the lungs).

## What are the different types of mesothelioma?

Mesotheliomas can start in 4 main areas in the body:

- ▶ **the chest** – the cancer starts in the mesothelium that lines the lungs (the pleura); this makes up about three-quarters of mesotheliomas
- ▶ **the abdomen** – the cancer starts in the mesothelium that lines the abdomen (the peritoneum); this makes up most of the remaining cases of mesothelioma
- ▶ **the heart** – the cancer starts in the mesothelium that surrounds the heart (the pericardium); this is very rare
- ▶ **the testes** – the cancer starts in the mesothelium that covers the testicles; this is also very rare.

Mesothelioma can also be divided into types based on how the cancer cells are arranged:

- ▶ epithelioid
- ▶ sarcomatoid (fibrous)
- ▶ mixed (biphasic) – the cells are a mix of epithelioid and sarcomatoid.

## What are the symptoms of mesothelioma?

The most common symptoms of pleural mesothelioma are:

- ▶ trouble breathing
- ▶ pain under the rib cage, in the side of the chest or in the lower back
- ▶ cough
- ▶ a mass under the skin in the chest
- ▶ fever
- ▶ fatigue (tiredness)
- ▶ excessive sweating
- ▶ weight loss

The earliest sign of asbestos-related disease is often pleural effusion, which is a build-up of extra fluid in the pleural cavity (the space between the two layers of pleura surrounding the lungs).

The symptoms of mesothelioma are often vague and general, and similar to those for many other conditions. If you have any of these symptoms, they are unusual for you and they persist, you should talk to your doctor.

## What are the risk factors for mesothelioma?

A risk factor is any factor that is associated with increasing someone's chances of developing a certain condition, such as cancer. Some risk factors are modifiable, such as lifestyle or environmental risk factors, and others cannot be modified, such as inherited factors, age or sex.

Having 1 or more risk factors does not mean that you will develop cancer. Many people have at least 1 risk factor but will never develop cancer, while others with cancer may have had no known risk factors. Even if a person with cancer has a risk factor, it is usually hard to know how much that risk factor contributed to the development of their disease.

Most people with mesothelioma have been exposed to asbestos, which might be present in the home or the workplace. It usually takes a very long time (20–50 years) for mesothelioma to develop after exposure to asbestos.

Asbestos is a naturally occurring mineral made up of tiny fibres. Because it is resistant to heat and fire, asbestos was previously commonly used in building materials, such as walls and roofing, and in insulation. When the asbestos breaks up – for example, when the building materials decompose over time, or during renovations – asbestos fibres can be inhaled and enter the lungs. The fibres can move to the pleural lining of the lung and chest wall, where they eventually cause normal cells to become cancer cells.

The risk of developing mesothelioma is greater in people who have been exposed to asbestos for a long time and at higher levels than in people who have had a lower level of exposure. However, most people who have been exposed to asbestos do not develop mesothelioma. The process that leads to the development of mesothelioma is not well understood.

Although exposure to asbestos is the only known risk factor for mesothelioma, some people who have had no clear exposure to asbestos develop mesothelioma. This suggests that there might be other causes, such as a gene mutation or prior radiation therapy to the chest for another type of cancer. However, these links have not been proven.

Smoking does not seem to be a risk factor for mesothelioma. However, people with mesothelioma who smoke may be advised to quit because smoking might interfere with cancer treatment.

## How is mesothelioma diagnosed?

You might have a number of tests to investigate your symptoms and confirm a diagnosis of mesothelioma, including:

- ▶ medical history and physical examination – a physical exam can pick up a pleural effusion, which is often the earliest sign of asbestos-related disease
- ▶ biopsy, where a small sample of tissue is taken from the pleura surrounding the lungs for examination under a microscope
- ▶ chest X-ray – this can pick up an abnormal thickening of the pleura or a pleural effusion
- ▶ computed tomography (CT) scan of the chest, which uses a series of X-rays to make a detailed picture of the chest – this can show the exact location of the cancer, its size and how far it has spread
- ▶ thoracentesis, a type of biopsy that removes a sample of fluid from the pleural cavity (the space between the two layers of pleura surrounding the lungs) for testing – this is done under local anaesthetic
- ▶ blood tests – these can show whether levels of certain substances (such as soluble mesothelin-related peptides) are higher than normal; this is often the case in people with mesothelioma.

A biopsy of the pleural tissue is often done using a small cut in the chest into which a thoroscope is inserted. A thoroscope is a thin, tube-like instrument that has a light and a camera for viewing, as well as a tool to remove the tissue sample. This procedure – called thoracoscopic biopsy – is done under general anaesthetic in an operating theatre.

If mesothelioma is diagnosed, pulmonary function tests might be used to see how well your lungs are working. This can be important if surgery to remove part of a lung might be used to treat the cancer. Pulmonary function tests involve breathing in and out through a tube connected to a machine.



## Treatment options

Treatment and care of people with cancer is usually provided by a team of health professionals – called a multidisciplinary team.

Treatment for mesothelioma depends on the stage of the disease, the severity of symptoms and the person's general health. Treatment may involve surgery to remove the affected area of the lung, and may also include radiotherapy and/or chemotherapy to destroy cancer cells.

Research is ongoing to find new ways to diagnose and treat different types of cancer. Some people may be offered the option of participation in a clinical trial to test new ways of treating mesothelioma.

### Finding support

You might feel overwhelmed, scared, anxious or upset if you have been diagnosed with cancer – these are all normal feelings. It's very important to have support from family, friends, health professionals or other services to help you cope with cancer.

*Living with cancer* has information about physical, emotional and practical issues during and after diagnosis and treatment.

Cancer Australia's resource *Cancer – How are you travelling?* provides information to help you understand the emotional and social impact of cancer. Order or download a copy.

The Cancer Council in your state or territory can give you general information about cancer, as well as information on resources and support groups in your local area.

Call the Cancer Council Helpline from anywhere in Australia for the cost of a local call on **13 11 20**.

Other cancer support organisations can also help you and your loved ones deal with the challenges of cancer.

### References

National Comprehensive Cancer Network (2016). Malignant pleural mesothelioma, version 1.2016.

National Cancer Institute (2016). Malignant mesothelioma treatment (PDQ®): patient version.

American Cancer Society (2016). Malignant mesothelioma.

