What are the health hazards of exposure to asbestos?

Exposure to asbestos may increase the risk of several serious diseases:

Asbestosis
a chronic lung ailment that can produce shortness of breath and permanent lung damage and increase the risk of dangerous lung infections

Lung Cancer

Mesothelioma
a cancer of the thin membranes around the lung (pleura) and abdomen (peritoneum)

Other cancers
such as cancer of the larynx and of the gastrointestinal tract

Asbestos that is bonded into finished products such as walls, tiles and pipes poses no risk to health as long as it is not damaged or disturbed (for example by sawing or drilling) in such a way as to release fibres into the air. However, when particles are set free and inhaled, exposed individuals are at risk of developing an asbestos-related disease.

The human body does have a clearance mechanism to deal with all sorts of dust and fibres. Large particles are coughed up in phlegm, and small particles which do reach the air-sacs inside the lungs are removed by white blood cells (**macrophages**) which move about the lungs and 'swallow' dust particles.

However, the problem with asbestos relates to its durability inside the human body.

If asbestos fibres are less than a certain diameter they may be small enough to penetrate the air sacs, and if they are above a certain length, they may be too long to be engulfed and swallowed by the macrophage.

The risk of developing asbestos-related diseases varies with the type of industry in which the exposure occurred and with the extent or dose of the exposure.

Although it is known that the risk to workers increases with heavier exposure and longer exposure time, investigators have found asbestos-related diseases in some shipyard workers exposed to high levels of asbestos fibres for only very brief periods (as little as 1 or 2 months).

Even workers who may have not worked directly with asbestos but whose jobs were near contaminated areas have developed asbestosis, mesothelioma and other cancers associated with asbestos exposure.

Generally, workers who develop asbestos-related disease show no signs of illness until many years after first exposure. For example, the time between first exposure to asbestos and the appearance of lung cancer is generally 15 years or more; a lag of 30 to 35 years is not unusual. The lag period for development of mesothelioma and asbestos is even greater, often as long as 40 to 45 years.

There is also some evidence that family members of workers heavily exposed to asbestos face an increased risk of developing mesothelioma and perhaps other asbestos-related diseases. This risk is thought to result from exposure to asbestos dust brought into the home on shoes, clothing, skin and hair of workers.

Macrophage on Asbestos

Macrophages normally engulf small particles in the lung. Asbestos particles however tend to rupture the macrophage on contact, releasing its contents into the surrounding lung tissue. This condition is characteristic of people suffering from asbestosis, a disease caused by inhalation of asbestos fibres.

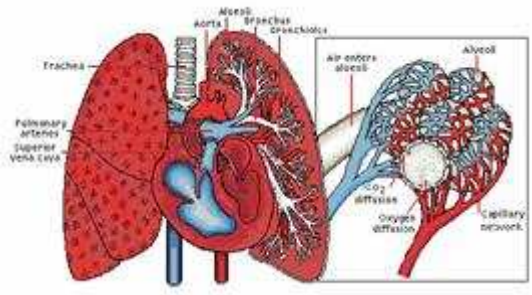
What is mesothelioma?

The chest and abdomen are lined by two layers of thin membrane (also known as mesothelium) which surround the organs in these areas.

- The lining around the lung is called the pleura
- and in the abdomen it is known as the peritoneum.
- **Mesothelioma is a cancer of this lining**.
- The function of the pleura is to protect the lungs and allow them to move smoothly in the chest.

When mesothelioma develops in the pleura the delicate lining thickens and fluid may also collect between the two layers of the pleura. If the lining of the abdomen is affected it causes thickening of the lining and a collection of fluid in the abdomen.

Human lungs



Air travels to the lungs through a series of tubes and airways. The two branches of the trachea, called bronchi, subdivide within the lobes in smaller and smaller air vessels. They terminate in alveoli, tiny air sacs, surrounded by capillaries. When the alveoli inflate with inhaled air, oxygen diffuses into the blood to be pumped by the heart to the tissues of the body. Asbestos fibres cause irritation to the alveoli resulting in thickening and scarring of these tiny air sacs, resulting in a decrease in the way oxygen can be diffused into the blood, and shortness of breath, one of the main symptoms of asbestosis.

Who is at risk?
Exposure to asbestos is still occurring, mainly through ignorance of the health hazards, or the mistaken belief that because asbestos is no longer used in new building materials, it is no longer a problem. This is clearly not the case. There were tonnes of asbestos containing materials

installed in pre-1980 buildings. and that is why it is so important to prevent exposure to asbestos now, so that asbestos-related diseases will eventually be eradicated.

Many people now dying from asbestos related disease previously worked in the building trade.

This includes trades like carpenters, joiners, electricians, shopfitters, plumbers, etc.

They unfortunately breathed asbestos dust during the course of their day to day work. Sometimes they were carrying out work on asbestos containing materials, but often their exposure to asbestos came from work that was being carried out by hers in their immediate vicinity.

Even other workers, not normally associated with the building trade may also routinely disturb asbestos, for instance general maintenance workers, computer cable installers, fire alarm installers, window blind fitters, telephone engineers, etc.

How does smoking affect risk?

Studies have shown that the combination of smoking and asbestos exposure is particularly hazardous. On average cigarette smokers are 10 times more likely to develop lung cancer as are non-smokers. For non-smokers who work with asbestos the risk is about five times greater than for those in the general population. Smokers who are heavily exposed to asbestos are as much as 90 times more likely to develop lung cancer that are non-exposed individuals who do not smoke.

Health records and medical surveillance for asbestos workers

Anyone who is exposed above the action level must have been medically examined within the previous two years. Employers will need to obtain certificates of examination, and/or copies for any new employees who state that they have had a 'medical' in their previous employment. Employers are also required to check with previous employers or the examining doctor to ensure that any certificates shown to them are genuine.

The employees health record should be kept for 40 years, in a safe place and should include the following information:

- Surname, forename, sex, date of birth, permanent address, postcode, national insurance number;
- A record of the types of work carried out with asbestos and, where relevant its location, with start and end dates and average duration of exposure in hours per week and details of any RPE used;
- A record of any work with asbestos prior to this employment; and dates of medical examination