

Policy and Public Health:

Understanding the Causes and Symptoms of Mesothelioma

Too often it seems the goals of public health and public policy do not align. On June 1, 2018, the EPA's Office of Pollution Prevention and Toxics proposed a "Significant New Use Rule" (SNUR) for certain uses of asbestos. While this SNUR will not formally remove any existing asbestos bans, it does have the potential to create new avenues for asbestos use.

Asbestos is a fibrous material that was once considered a "miracle mineral" for construction and manufacturing because of its heat resistance and durability. However, it is now recognized as a dangerous carcinogen. Though health risks related to asbestos exposure were revealed nearly a century ago, asbestos is not banned in the United States. In fact, any material or product that contains less than one percent asbestos is not officially considered an "asbestos-containing material" (ACM).

This qualification suggests that materials that do contain asbestos but are not classified as ACMs are not harmful, but multiple studies have concluded that there is no "safe" level of asbestos exposure. In fact, asbestos is the only known cause of a rare, aggressive cancer called mesothelioma.

What is mesothelioma?

Mesothelioma is a rare cancer caused by the inhalation of microscopic asbestos fibers. When these fibers are inhaled or ingested, they can become lodged in the linings of the lungs, heart, or abdomen. Over time, the tissue surrounding these fibers can become irritated, creating scar tissue that can develop into tumors.

The prognosis for mesothelioma patients is often poor, with a usual life expectancy of one to two years after diagnosis. Mesothelioma has a long latency period (anywhere from 10 to 50 years), and this coupled with the rarity of the disease can make it difficult to reach an accurate diagnosis. Early mesothelioma symptoms are often mistaken for more common conditions like the flu, pneumonia, or lung cancer. Symptoms can also vary depending on the type of mesothelioma and the stage of the cancer, making it difficult to ensure patients get the care they need initially.

How is mesothelioma diagnosed?

It is important for physicians to understand what a patient is experiencing in order to identify what tests should be done and what treatments will be most helpful. Diagnosis typically begins

with a physician analyzing symptoms. Malignant pleural (lungs), pericardial (heart), and peritoneal (abdomen) mesothelioma often have different symptoms because they occur in different areas of the body.

Pleural mesothelioma symptoms include: lower back or chest pain, difficulty swallowing, persistent coughing, coughing up blood, shortness of breath, and fluid build up around the lungs (pleural effusion).

Pericardial mesothelioma symptoms include: irregular heartbeat or heart murmurs, fatigue, fever, chest pain, shortness of breath, and pericardial effusion.

Peritoneal mesothelioma symptoms include: abdominal pain and swelling, difficulty breathing, bowel obstruction, weakness, loss of appetite, nausea and vomiting, unexplained weight loss, and peritoneal effusion.

In addition to the type and stage of the cancer, other factors can impact the severity and number of symptoms. Though all forms of asbestos are dangerous, crocidolite is considered one of the most hazardous forms of asbestos and may cause symptoms to appear earlier. Duration and amount of asbestos exposure can also be a factor, and individuals working in occupations with a higher rate of asbestos exposure might experience symptoms earlier as well. Additionally, elderly patients can show early onset symptoms because they may be weaker than those affected by mesothelioma at a younger age.

If symptoms of mesothelioma are suspected, a variety of diagnostic tests for the patient should be considered. Various image tests can be used in the early stages of diagnosis, including X-rays, CT scans, MRIs, and PET scans. Though image tests cannot diagnose mesothelioma entirely on their own, they are useful for determining the presence and possible stage of the cancer.

Medical professionals can also use blood tests to diagnose mesothelioma because the disease produces abnormal substances in the bloodstream. Unfortunately, the presence or absence of these substances alone is not enough to diagnose or rule out this rare cancer. While multiple promising mesothelioma biomarkers exist, a mesothelioma biopsy procedure is currently the only way to confirm a diagnosis.

Current Mesothelioma Treatments

Although there is no cure for mesothelioma,

nearly all affected patients have curative or palliative treatment options that can extend their prognosis, alleviate pain, and increase quality of life. Surgery, radiation, and chemotherapy are the three primary forms of treatment currently used to fight cancer.

For mesothelioma specifically, surgery can be used in the early stages of the disease to remove as many of the cancer cells as possible. Surgery can also be used as a palliative therapy to help reduce pain or discomfort when the cancer has spread beyond the pleural cavity.

Chemotherapy can be used to shrink cancerous mesothelioma tumors before surgery. It can also be used after surgery as an adjuvant treatment to help remove any remaining cancer cells and increase the effectiveness of the primary treatment. Chemotherapy can be used on its own, or in combination with radiation therapy to stall cancer growth or reduce tumor size. As for radiation treatment, it can be used to target and destroy cancer cells at the molecular level to stop reproduction.

Emerging Experimental Treatments

Researchers, scientists, and doctors are constantly looking for more effective cancer treatment options. For mesothelioma specifically, researching treatment options involves adapting techniques used to fight other forms of cancer. Clinical trials play a huge role in providing treatment options for certain mesothelioma patients.

Immunotherapy has been cited as having the potential to prolong mesothelioma patient life expectancy. Unlike chemotherapy, which attempts to kill cancer cells, immunotherapy seeks to activate the immune system's natural cancer-fighting abilities. Though it is currently only available through clinical trials for mesothelioma patients, the method could be an effective option for treating malignant mesothelioma as well.

Gene therapy is another investigational therapy that could play a crucial role for mesothelioma patients. One of these techniques is called "suicide" gene therapy. In this therapy, suicide genes are introduced into the body where they produce an enzyme that creates sensitivity in the tumor cells. This weakness will eventually cause the modified cancer cells to die without affecting normal cells.

Over 50,000 people have died from mesothelioma and asbestos-related diseases since 1999. Because asbestos is not banned in the United States, it is important for patients and medical practitioners to know the dangers associated with asbestos exposure and the signs and symptoms of mesothelioma. Though there is not cure for mesothelioma, early detection of the disease can greatly impact patient prognosis and survival rate. ■