Silicosis

Pulmonary Fibrosis Foundation™

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What is silicosis?

Silicosis is a lung disease caused by breathing in silica dust. Silica is a mineral found in stone, rock, sand, and some building materials. When silica dust is inhaled into the lungs, it can cause inflammation and permanent scarring of the lungs. This scarring is called fibrosis.

There are different types of silicosis. Some people have mild disease (called simple silicosis), while others develop more severe disease that can continue to worsen over time (called complicated silicosis or progressive massive fibrosis).

What are the symptoms of silicosis?

Some people with silicosis have no symptoms, especially in the early stages. Changes may be seen on a CT scan before symptoms develop. Symptoms can include shortness of breath, cough, tiredness or fatigue, chest pain or chest tightness, and low oxygen levels.
In more severe cases, people may have difficulty with everyday activities such as walking or climbing stairs.

Some people develop advanced silicosis, which can lead to serious breathing problems and, in some cases, death. However, not everyone with silicosis develops advanced disease.
Living with a long-term lung condition can also affect mental health. Some people may experience stress, anxiety, or depression.

What causes silicosis?

Silicosis is caused by breathing in silica dust, usually over many months or years. When silica dust reaches the lungs, the body's immune system tries to remove it. However, silica particles cannot be broken down or removed completely. This causes ongoing inflammation in the lungs. Over time, the inflammation can damage lung tissue and lead to fibrosis (permanent lung scarring). In some people, lung damage can continue even after they are no longer exposed to silica dust.

What would make me more likely to have been exposed to silica dust?

People who work with stone are at the highest risk of silica exposure. This includes people who cut, grind, drill, polish, or install artificial (engineered) stone. Other jobs with silica exposure include construction work, mining, quarrying, stone masonry, sandblasting, tunnelling and road work.

Wearing a properly fitted respirator and using wet cutting methods can reduce exposure to silica dust. However, these measures may not remove the risk completely. Having an artificial stone benchtop in your home does not put you at risk of silicosis. Silica dust is mainly produced when materials containing silica are cut, drilled, ground, or polished.

How is silicosis diagnosed?

Pulmonary function tests (PFTs) and chest X-ray are often the first tests your doctor may order if you are having cough and shortness of breath. These tests may show changes that could be related to silicosis, but abnormalities may be due to many different types of lung diseases. Additionally, these tests may still be normal in early or mild disease. To confirm the diagnosis or gather more information, your doctor may order computed tomography of the chest (CT scan). This test provides more detailed images of the lung. Your doctor may order other tests to rule out other conditions that may have overlapping signs and symptoms, such as bloodwork to assess for infection or autoimmune disease, or bronchoscopy with or without biopsy to rule out infection or cancer.

My doctor said my CT scan (or biopsy) showed silicosis. What does that mean?
CT scan findings that suggest silicosis include nodules, often in the upper lobes of the lung, that can grow into masses, termed progressive massive fibrosis as mentioned above. Enlarged lymph nodes in the chest can often occur as a reaction to this process.

A lung biopsy is sometimes performed to confirm silicosis. Under the microscope, the classic biopsy finding is termed a "silicotic nodule," consisting of a collection of collagen (connective tissue) sometimes with calcium overlying. Lymph node biopsies in patients with silicosis may reveal silica particles and the body's reactions to them, termed "dust-laden macrophages."

How is silicosis treated?

There is no cure for silicosis, thus preventing disease via exposure prevention is critical. Your doctor may recommend a trial of steroids if active inflammation is suspected or if the exposure was relatively recent. Specialized therapies such as whole lung lavage (or trying to wash the silica particles out of the lung) may be recommended in specific situations and should only be performed at tertiary care centers such as a PFF Care Center or major medical centers with ample clinical experience. Patients with silicosis and progressive pulmonary fibrosis may be candidates for the use of antifibrotic medications based on the specific clinical circumstances.

Treatment of coexisting pulmonary conditions is also important. If your testing shows that you have obstructive lung disease, you may be started on inhaler therapy to help your symptoms. Airway clearance therapy can benefit patients with significant sputum production. Tuberculosis is an infection that oftentimes coexists with silicosis, and your doctor may test and treat you for this infection if appropriate.

How does silicosis progress? What is my prognosis?

Progression in silicosis is often variable, with some patients having stable disease and others experiencing progressive decline in lung function, increase in symptoms, and worsening of radiographic findings. The tempo of this progression can be slow or rapid. Serial pulmonary function testing and CT scans are often recommended to assess for progression over time. One of the reasons that some patients might progress faster than others is ongoing exposure, which is why if you are diagnosed with silicosis, it is essential to work with your medical team and your workplace to reduce exposure or consider switching to another job with less exposure.

In patients who experience worsening of their disease and dependence on oxygen therapy, referral for lung transplantation may be indicated.

Are there experimental treatments available?

There are a number of clinical trials that have been conducted, but none of the treatments studied yet have enough evidence to recommend them to all patients. These include whole lung lavage, immunosuppression such as steroids, and antifibrotic medications.

Other therapies, including anti-inflammatory and immunomodulatory compounds, have been studied in animals but have yet to undergo clinical trials in humans with silicosis.

You can search for research studies closest to you on our PFF Clinical Trial Finder at trials.pulmonaryfibrosis.org.

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