CONDITION

Silicosis

Silicosis is permanent lung scarring caused by breathing in fine crystalline silica dust.

WHAT IT IS
Lung inflammation and scarring from inhaled silica dust

BODY SYSTEM
Lungs and breathing

MAIN SYMPTOMS
Shortness of breath, cough, fatigue, chest discomfort

WHAT CAUSES IT
Breathing fine crystalline silica dust

HOW IT IS DIAGNOSED
Exposure history plus chest imaging; sometimes lung biopsy

MAIN TREATMENT
Stopping exposure, symptom control, and lung rehabilitation

CAN IT BE CURED?
No - lung scarring is permanent

IS IT AN EMERGENCY?
Sometimes - severe breathing trouble or coughing blood

LONG-TERM OUTLOOK
Often progressive; severe cases can shorten life

Overview

Silicosis is a long-term lung condition caused by breathing in respirable crystalline silica. "Respirable" means the particles are small enough to travel deep into the lungs. Crystalline silica is found in materials such as stone, concrete, brick, mortar, sand, and engineered stone.

Inside the lungs, silica particles trigger inflammation. Over time, this can produce fibrosis, which means permanent scar tissue. The scarring makes it harder for the lungs to move oxygen into the blood.

Silicosis is most often linked to work that cuts, drills, crushes, grinds, or polishes silica-containing materials. People working with engineered stone can face particularly intense exposure if dust controls are poor. Mining, quarrying, construction, tunnelling, foundry work, sandblasting, and some manufacturing jobs can also create hazardous dust.

The condition may develop in different patterns. Chronic silicosis usually appears after many years of exposure. Accelerated silicosis develops sooner after heavier exposure. Acute silicosis can develop within months or a few years after extremely high exposure and may worsen quickly.

Silicosis matters even when symptoms are mild. The scarring can progress, and the condition raises the risk of tuberculosis and other lung problems. Avoiding further exposure and attending regular follow-up can help protect the lung function that remains.

Symptoms

Early silicosis may cause no noticeable symptoms. Changes may first appear on a workplace health check or chest scan.

When symptoms occur, they may include:

Symptoms often develop gradually. They can be mistaken for ageing, smoking-related lung problems, asthma, or being out of shape.

More advanced silicosis may cause marked breathlessness, frequent chest infections, unintended weight loss, or low oxygen levels. Low oxygen can sometimes lead to headaches, poor concentration, or a bluish or grey colour around the lips.

Acute silicosis can look different. It may cause rapidly worsening breathlessness, cough, fever, fatigue, and weight loss. These symptoms need prompt medical assessment because infection and other serious lung conditions can cause a similar pattern.

- Shortness of breath, first during activity and sometimes later at rest
- A persistent cough, which may be dry or produce mucus
- Tiredness or reduced ability to exercise
- Chest tightness or discomfort

Causes and risk factors

Silicosis is caused by inhaling crystalline silica dust. It is not caused by casual contact with intact stone or concrete. The main risk comes when work creates airborne dust that can be breathed deep into the lungs.

Tasks that may generate this dust include cutting, grinding, polishing, drilling, crushing, sweeping, or demolishing silica-containing material. Dry work methods and enclosed or poorly

ventilated spaces can greatly increase exposure.

Risk is affected by:

Silicosis can occur in people who have never smoked. Smoking does not cause it, but smoking and silica exposure together can further damage breathing and increase the risk of other lung conditions.

Family members are not at risk from ordinary contact with someone who has silicosis. However, dusty work clothing can carry silica into a vehicle or home. Workplaces should provide safe methods for changing, cleaning clothing, and controlling contaminated dust.

- How much silica is in the material
- How much airborne dust the task creates
- How long and how often exposure occurs
- Whether effective ventilation, water suppression, and respiratory protection are used
- The total exposure built up over a working lifetime

Diagnosis

Diagnosis begins with a detailed history of work and other possible dust exposure. It is important to describe past jobs as well as current work. Silicosis can appear years after exposure has ended.

Chest imaging is central to diagnosis. A chest X-ray may show small rounded areas of scarring, often in the upper parts of the lungs. High-resolution computed tomography, or HRCT, gives more detailed images and can detect changes that are not clear on an X-ray.

Breathing tests measure how much air the lungs can hold, how quickly air can be blown out, and how well oxygen moves from the lungs into the blood. These tests help show the effect on lung function, but they do not confirm silicosis by themselves.

Blood tests, mucus samples, or other investigations may be used to look for tuberculosis, infection, autoimmune conditions, or other causes of abnormal scans. A lung biopsy, which removes a small tissue sample, is sometimes considered when the exposure history or imaging is unclear. It is not needed in every case.

A diagnosis usually relies on a credible history of silica exposure, a compatible pattern on chest imaging, and the exclusion of other likely causes.

Treatment and management

There is no treatment that reliably removes silica from the lungs or reverses established scarring. Management focuses on preventing further exposure, monitoring the condition, easing symptoms, and treating complications.

Avoiding additional silica dust is essential. This may require changes to tasks, stronger workplace controls, reassignment, or leaving hazardous work. Decisions about employment can have major financial and practical effects, so occupational health, workplace safety, union, legal, or compensation services may be helpful.

Treatment may include:

Corticosteroids and medicines that suppress the immune system have not been shown to reverse chronic silicotic scarring and are not routine treatment. Whole-lung lavage, a procedure that washes material from the lungs under anaesthesia, has been tried in selected acute cases, but its role is limited and specialised.

People with advanced breathing failure may be assessed for lung transplantation. This is a major procedure with strict eligibility requirements and lifelong follow-up.

Regular monitoring may include symptom reviews, breathing tests, oxygen measurements, and chest imaging when clinically appropriate. Because silicosis increases tuberculosis risk, testing for tuberculosis may also be recommended based on personal risk and local practice.

- Pulmonary rehabilitation, combining supervised exercise, breathing education, and practical support
- Inhaled medicines if asthma-like narrowing or another airway condition is also present
- Supplemental oxygen when testing shows persistently low oxygen levels
- Antibiotics or other treatment for confirmed respiratory infections
- Vaccination intended to reduce the risk of serious respiratory infections
- Support to stop smoking, if relevant

Complications

Silicosis can lead to progressive massive fibrosis. This means smaller scarred areas join into large masses, causing more severe loss of lung function.

Other possible complications include chronic bronchitis, emphysema, and repeated chest infections. Pulmonary hypertension can develop when pressure rises in the blood vessels of the lungs. This puts strain on the right side of the heart.

Silica exposure and silicosis increase the risk of tuberculosis. Tuberculosis may be active, causing illness and spreading to others, or latent, meaning the bacteria are present without symptoms. Other mycobacterial infections can also occur.

Crystalline silica exposure is a recognised cause of lung cancer. Silica exposure has also been associated with kidney problems and autoimmune conditions, in which the immune system mistakenly attacks the body. These outcomes do not happen to everyone with silicosis, but they are reasons for ongoing follow-up.

Anxiety, low mood, financial stress, and uncertainty about work are also common concerns. These effects are part of living with an occupational lung condition and deserve practical and emotional support.

Prevention

Silicosis is preventable by controlling exposure to respirable crystalline silica. Once lung scarring has formed, it cannot be prevented retroactively or reversed, but avoiding further exposure may reduce additional harm.

The most effective controls stop dust from entering the air or remove it near its source. Examples include using lower-silica materials, enclosed machinery, local exhaust ventilation, and water-fed cutting or grinding tools. Dust should be cleaned with suitable vacuum systems or wet methods rather than dry sweeping or compressed air.

Respirators may be needed for some tasks, but they should not replace dust control at the source. Workplace respiratory protection requires the correct type of equipment, proper fit testing, training, maintenance, and clean-shaven contact where the mask seals against the face.

Workplace air monitoring and health surveillance can help identify unsafe exposure and early lung changes. Workers should receive clear information about the materials they handle and the controls required for each task.

Living with it and what to expect

The course of silicosis is not the same for everyone. Some people with limited chronic silicosis remain stable for years, especially after exposure stops. Others have a gradual decline in breathing. Accelerated and acute forms are more likely to progress quickly.

Stopping exposure does not guarantee that progression will stop. Silica particles and the inflammatory response can remain in the lungs after the work has ended. This is why follow-up

remains important even if symptoms are unchanged.

Breathlessness can affect work, household tasks, travel, and exercise. Pulmonary rehabilitation can help you use your available lung function more effectively. Pacing activities, taking planned rest breaks, and staying active within safe limits may make daily life more manageable.

If oxygen is prescribed, the clinical team will explain when and how it should be used. Oxygen helps low blood oxygen; it is not a general treatment for every type of breathlessness.

Keeping copies of job histories, exposure records, safety reports, scans, and breathing-test results can be useful. Silicosis may qualify for occupational injury reporting, workplace compensation, or financial support, but the process differs by location.

Many people continue ordinary family and social activities, although work changes and reduced stamina may require adjustment. More advanced silicosis can limit independence and may shorten life. Follow-up can identify complications early and support planning as needs change.

When to get medical help

Arrange a routine medical appointment if you have persistent cough or breathlessness and have worked with stone, concrete, sand, mining dust, or another source of silica. Mention all relevant jobs, including work from many years ago.

If you have already been diagnosed, attend planned reviews even when you feel well. Seek earlier advice if your breathing is gradually worsening, you are losing weight without trying, or respiratory infections are becoming more frequent.

Seek urgent same-day assessment for a sudden change in breathlessness, fever with worsening cough, new blood in mucus, or chest pain. These symptoms may be caused by infection, a blood clot, a collapsed lung, or another problem that needs prompt evaluation.

Call emergency services for severe difficulty breathing, blue or grey lips, confusion, fainting, severe chest pain, or more than a small streak of coughed-up blood. Do not drive yourself if breathing is severely affected.

Common questions

Can silicosis go away after I stop working with silica?

Stopping exposure is important, but existing scar tissue does not go away. Some people

remain stable after exposure ends, while others continue to have gradual progression.

Is silicosis contagious?

No. Silicosis cannot spread between people. Tuberculosis can be contagious, however, and people with silicosis have a higher risk of developing it.

How long does silicosis take to develop?

Chronic silicosis usually follows many years of exposure. Heavier exposure can cause accelerated silicosis within several years. Extremely intense exposure can rarely cause acute silicosis within months.

Can a chest X-ray prove I have silicosis?

An X-ray can show a pattern consistent with silicosis, but it is interpreted alongside your exposure history and other findings. A CT scan may provide more detail, and other conditions may need to be excluded.

Can I keep working around silica after diagnosis?

Further exposure can add to lung injury. Whether a workplace can be made safe requires an assessment of the tasks, measured dust levels, and control systems. Occupational health and workplace safety services can help assess options such as reassignment.

Does silicosis always get worse?

No single course applies to everyone. Some cases remain stable for long periods, while others progress despite exposure ending. The type of silicosis, total exposure, lung function, and complications all influence the outlook.

Sources

- Centers for Disease Control and Prevention, National Institute for Occupational Safety and Health. Silica and Worker Health
- Occupational Safety and Health Administration. Respirable Crystalline Silica
- Health and Safety Executive. Silicosis
- Leung CC, Yu ITS, Chen W. Silicosis. The Lancet. 2012;379:2008-2018 60235-9)
- Hoy RF, Chambers DC. Silica-related diseases in the modern world. Allergy. 2020;75:2805-2817
- International Agency for Research on Cancer. Silica Dust, Crystalline, in the Form of Quartz or Cristobalite. IARC Monographs, Volume 100C