

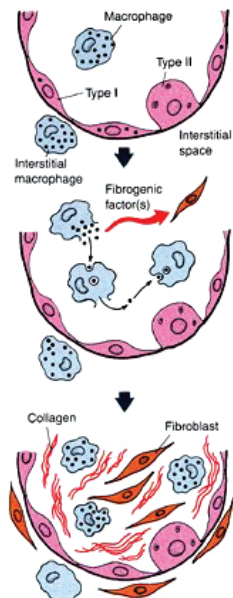
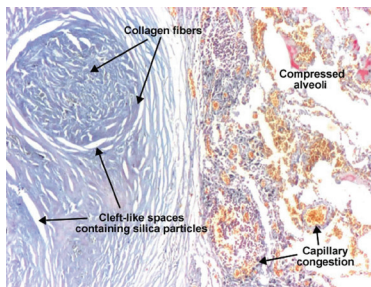
# Occupational Lung disease

## Silicosis: The tragic return of an old disease

Silicosis is a specific inhalational dust disease which has been around for centuries, ever since humans have had the ability to work with quartz, the crystalline form of silicon dioxide.

Depending on the intensity and duration of exposure there are three types of silicosis:

- Acute silicosis results from short-term exposure to very high levels of silica over a period of weeks or months to several years.
- Accelerated silicosis results from 5-10 years exposure to high levels of silica. This is becoming more common in people who work with engineered stone.
- Chronic silicosis results from long-term (more than ten years) exposure to lower levels of silica.



With the recent increased popularity of stone benchtops in kitchens and the advent of artificially manufactured stone, there has been a significant rise in cases of accelerated silicosis in Australian stonemasons.

The pathogenesis of silicosis involves the alveolar macrophages engulfing inhaled free silica particles, entering the lymphatics and interstitial tissue. The macrophages cause a release of cytokines (tumour necrosis factor-alpha, IL-1), growth factors (tumour growth factor-beta), and oxidants, stimulating parenchymal inflammation, collagen synthesis and, ultimately, fibrosis. As the free particles are unable to be destroyed the cycle continues indefinitely resulting in pulmonary nodules of varying size, mediastinal adenopathy and depending on the silica load, progressive fibrosis and death from respiratory failure.

Particles of free silica, less than 10 micrometres in diameter, usually liberated from modern day grinding, shaping and cutting tools, generate silica dust with levels many thousand times what is considered safe background levels (0.1mg/m<sup>3</sup>). Particles of this size enter the terminal alveola and are taken up by the macrophages starting the silicosis cycle.



Unfortunately, artificial stone industry is unregulated, the stone masons are generally not trained in appropriate personal protection, nor is it offered due to cost. This has resulted in a significant number of cases of silicosis in Australia, usually in young males from low socio-economic backgrounds with young families.

In September 2018 alone, 22 workers compensation claims for silicosis in Queensland were passed through and at least 6 cases were considered terminal. This is likely the tip of the iceberg as there are many thousands of exposed individuals and due to the latency of disease from initial exposure (when the artificial stone industry took off), there will be many more cases diagnosed.

A national screening initiative has commenced, however, this will take some time to determine when and how to screen individuals at risk, especially given stonemasons tend to be transient in nature and move between regions. A national screening database is urgently needed to address this problem. Also others are at risk of silicosis, including those working close to stonemasons, families of stonemasons and also other occupations working with silica dust, including the mining and cement industry.

Symptoms of silicosis are non-specific and can be mild at the beginning of the disease, the most common symptom being cough and dyspnoea.

If you have a patient, usually a male who presents with non-specific cough or breathlessness, and an occupational history suggestive of silica exposure, a CXR (mention silica exposure on the form) and spirometry is an adequate starting point for screening. If abnormal, discussion with your local Thoracic Physician or WorkCover will be of assistance.

The tragedy of accelerated silicosis is that it is an avoidable condition with appropriate occupational health and safety precautions (positive pressure ventilation, wet cutting and dust extraction). Unfortunately, there is no treatment for accelerated silicosis presently.

[Click here for more about Dr Stephen Vincent](#)

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