

Silicosis: From Gauley Bridge to Artificial Stone

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Silicosis

- A preventable lung disease caused by excessive silica exposure
- Disease may result in difficulty breathing, cough, infections, need for home oxygen, lung transplant, and death

Selected Sources of Silica Exposure

- Mining, Tunnelling and Excavating
- Foundries
- Abrasives
- Ceramics
- Construction
- Crafts
- Glass making
- Gemstone workers
- Agriculture

Silicosis

- Agricola, 16th century, of miners in the Carpathian mountains: “women are found to have married seven husbands, all of whom this terrible consumption has carried off to a premature death.”
- Silica medically recognised as cause of chronic lung disease in mid-19th century

Silicosis

- Hawks Nest Tunnel disaster, near Gauley Bridge, WV, USA
- Silicosis in the 21st century



Hawks Nest Tunnel







Hawks Nest Tunnel

- Parts of mountain was 99% sandstone
 - >90% silica
 - Mined for steel production
- Project completed in 18 months
- Dry drilling used mostly
- No dust measurements
- Respirators worn by engineering staff, but not workers
 - “Eye protection”



US National Park Service

- Men began getting sick shortly after construction started
- Company doctors called the illness “tunnelitis”
- One Hawks Nest worker: “Each and every day I worked in that tunnel, I helped carry off 10 to 14 men who was overcome by the dust”

- Workers denied breaks to step out and breathe clean air
- Sick workers often forced from bed at gunpoint
- Average length of employment 15-16 weeks

Acute Silicosis



Hawks Nest Tunnel Disaster

- 3000 workers who worked in tunnel
- 109 admitted deaths by Union Carbide
- Estimated 500-1000 deaths in 1930-1935

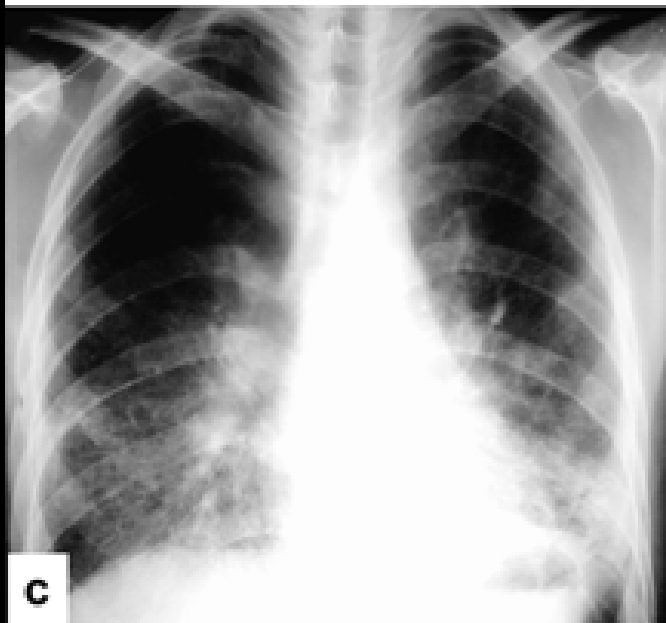
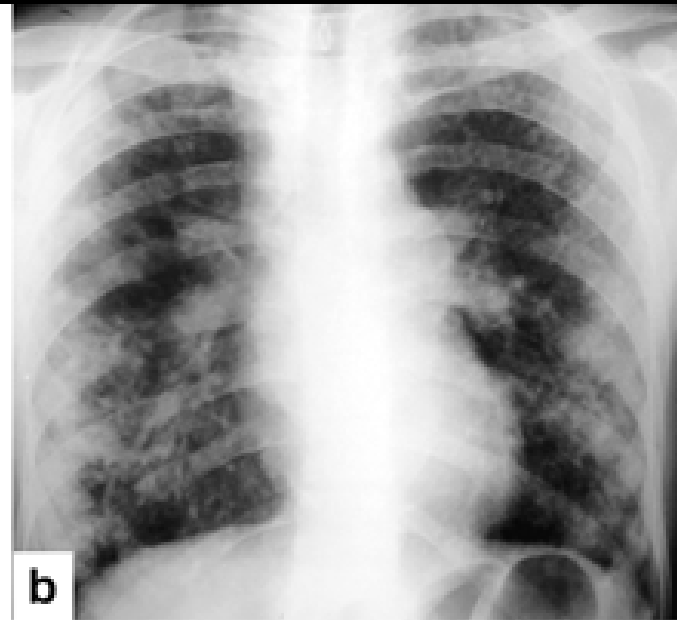
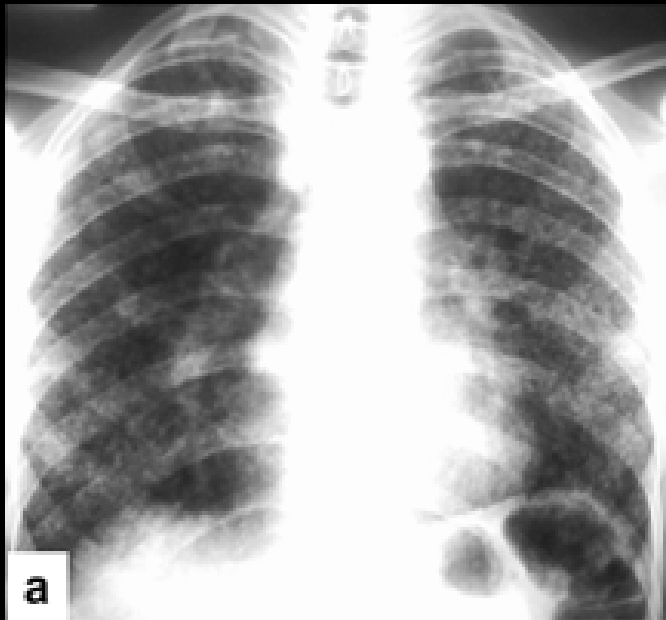


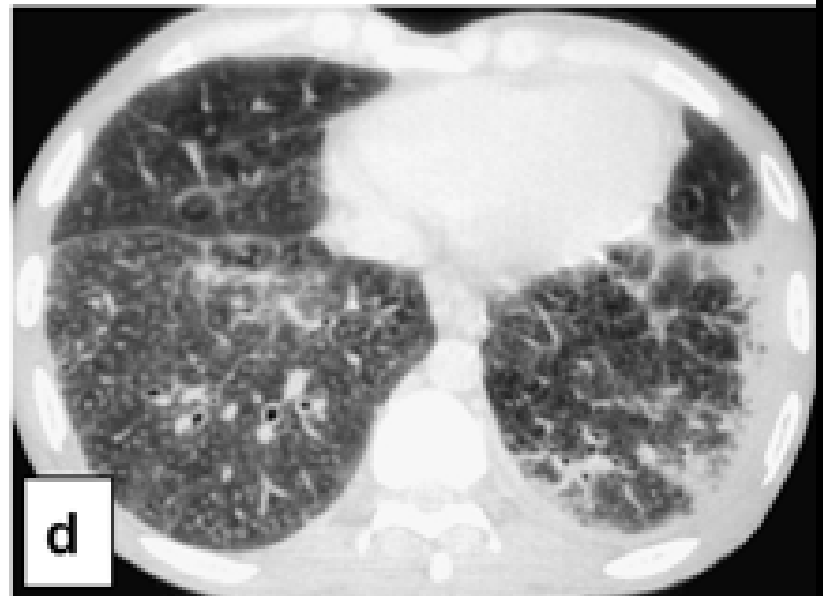
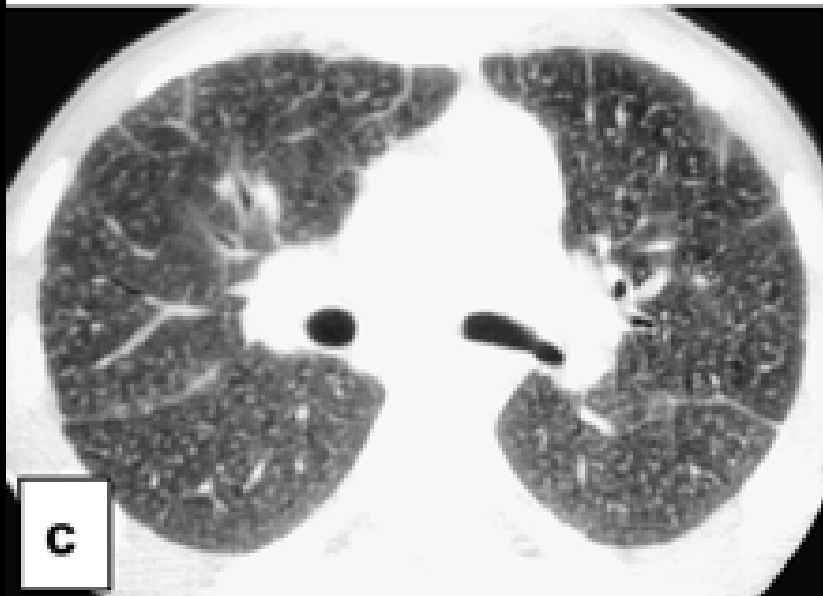
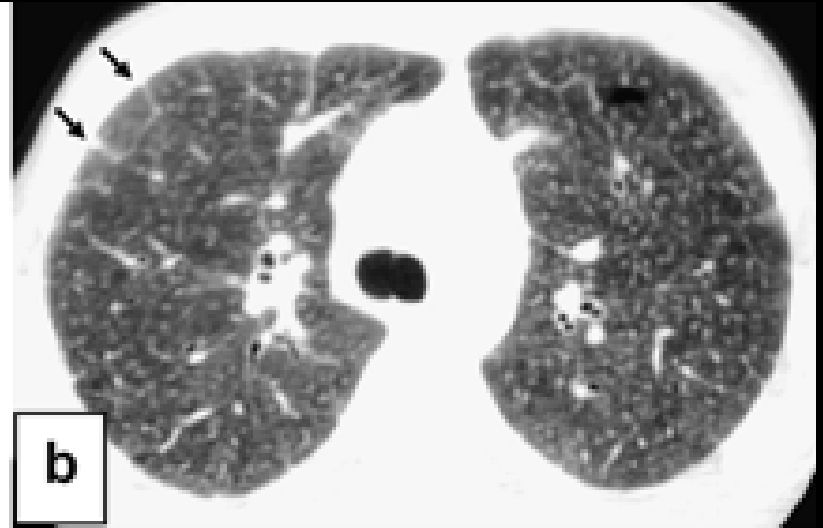
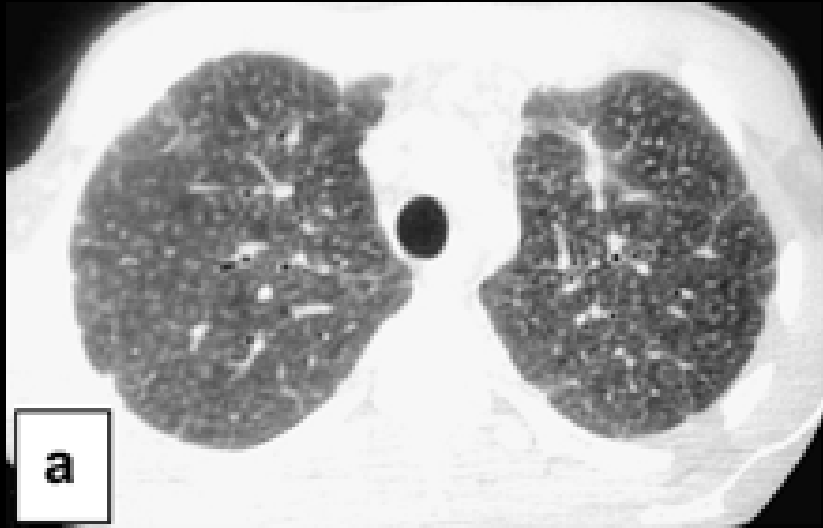
Silicosis in the 21st Century

Sandblasted Denim





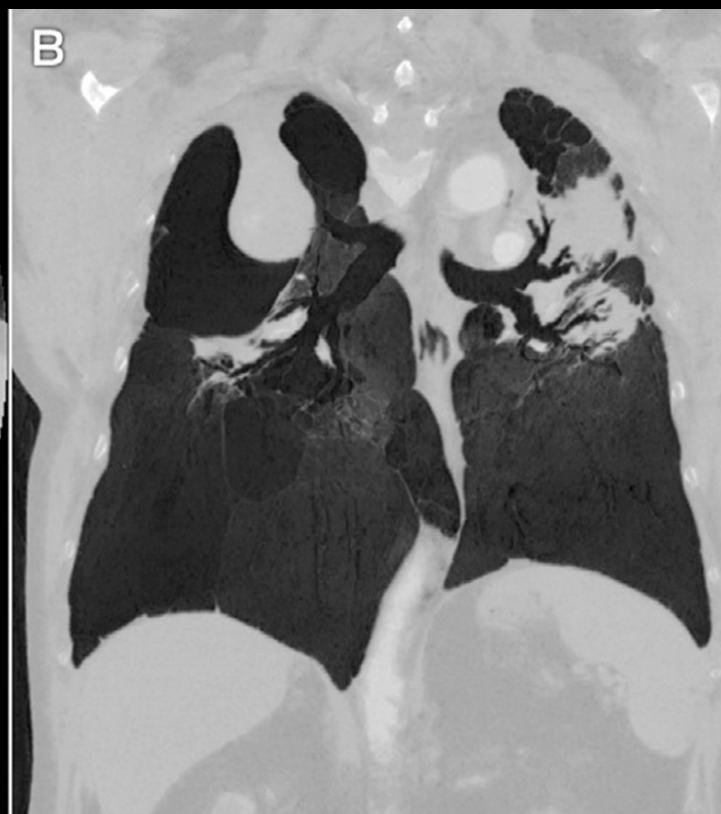
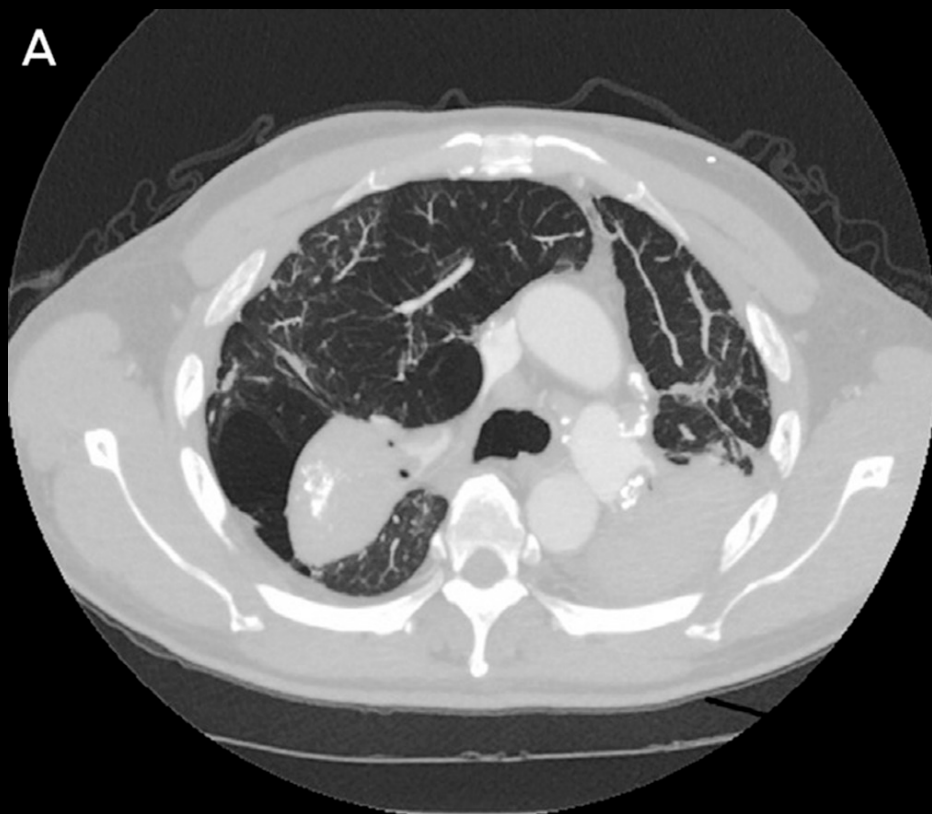




Artificial Stone



Artificial Stone Silicosis



Silicosis

- Although very toxic, silica's effects are often delayed
 - Importance of education and awareness
 - Need for protections to extend past time of employment
- Silica exposure can occur in many work settings
 - Poses challenges to spreading awareness and institute changes
- Chest imaging (x-rays, CT scans) may show abnormalities before a worker feels sick
 - Importance of screening

Silicosis

- Silicosis is preventable
 - Ideally avoid unnecessary silica exposure
 - Importance of adequate protection via regulations and laws
 - Adherence
 - Engineering controls to reduce exposure
 - Wet cutting
 - Ventilation
 - Personal protective equipment as a last line of prevention