



# Prevention of Silicosis Deaths<sup>1</sup>

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National Institute for Occupational Safety and Health<sup>2</sup>

NIOSH issues Alerts in response to immediate occupational health hazards. The Alerts are designed to inform workers that they are at risk and to propose ways of reducing that risk. Prevention of hazardous conditions cannot occur unless workers are in fact aware of hazards and how to avoid them. To accomplish this task, NIOSH Alerts request the assistance of health and safety officials, editors of appropriate trade journals, and employers in the effort to inform workers and implement recommendations. It is the goal of the Institute that through dissemination of these warnings, occupational injury and disease will be prevented.

More than one million American workers are currently at risk of developing silicosis, a debilitating, irreversible, sometimes fatal disease. The cause of silicosis has been known for centuries, yet Americans continue to die each and every year of this completely preventable disease. Silicosis is caused by breathing in particles of crystalline silica -- the primary component of sand. Since 1974, the National Institute for Occupational Safety and Health (NIOSH) has recommended that silica sand be banned for use in abrasive blasting, and that a substitute material be used. The practice of using sand in abrasive blasting has been outlawed in the United Kingdom since 1949. Today, it is estimated that 100,000 American sandblasters are at risk of developing silicosis.

## CONTINUING HUMAN TRAGEDY

Every diagnosis of silicosis demonstrates the continuing human tragedy of this clearly preventable disease. In January 1992, NIOSH learned of the premature death from silicosis of a 55-year-old sandblaster in Cleveland. A subsequent study of the worksite found several additional workers with silicosis. One of those identified was a 37-year-old man who now spends his time at home connected to an oxygen tank.

He worked his last day on April 2, the day that NIOSH conducted a medical evaluation of the workers at the shop in Cleveland.

"I had never heard of silicosis," said the worker speaking of his diagnosis. "There was one other man there who had died, but the boss told us he died of TB. We never thought of silicosis. When NIOSH came out to the parking lot with that portable hospital type thing, they did a bunch of tests and told me to see a doctor. All the questions they were asking seemed to apply to the way I was feeling." He said he had been experiencing discomfort for about a year, but could not afford to see a doctor to find out why. "I had shortness of breath when I would try to climb steep hills and things like that. It really got bad in the winter when it got cold. With that cold wind blowing I couldn't walk. I was struggling just to move."

"It is unacceptable to allow workers to continue to die from preventable diseases such as silicosis. All workers who use silica must be told of the hazards they face and the means of prevention," said Dr. Greg Wagner, Director of the NIOSH Division of Respiratory Disease Studies. NIOSH has issued an Alert nationwide to notify other workers, employers, trade unions, regulatory agencies, and other occupational and public health agencies of the risk of silicosis from sandblasting. The document describes 99 cases of silicosis among sandblasters. Of the 99 cases, 14 have already died of the disease, and the remaining 85 may eventually die from silicosis or its complications. The victims, ranging in age from 23 to 55, died due to working conditions which NIOSH has found to be common at sandblasting worksites. Unfortunately, these cases are not unique. According to Wagner, "Nationally, the cases reported may be only the tip of the iceberg of people afflicted with silicosis." The document describes the acute and

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chronic effects of silica exposure and outlines the crucial prevention steps.

### WHO IS AT RISK?

Workers using silica sand for the purpose of abrasive blasting are at risk. Abrasive blasting is the process of using compressed air or steam to forcefully project abrasive particles onto a surface. The process is frequently used to clean sand and irregularities from foundry castings, to clean and remove paint from metal surfaces, to finish tombstones, to etch or frost glass, and for artistic purposes.

### HOW DOES EXPOSURE OCCUR?

The silica sand used in blasting typically fractures into fine particles and becomes airborne. The worker then inhales the silica which becomes imbedded in the lungs. Most sandblasters continue to work without adequate respiratory protection, and workers near the sandblaster frequently wear no protection at all.

### WHAT ARE THE HEALTH EFFECTS?

Once the silica particles enter the lungs and become trapped, the lung tissue scars and forms nodules. As the condition worsens, the nodules become progressively larger. The nodules make breathing increasingly difficult, eventually causing the worker to die from suffocation.

The symptoms of silicosis include shortness of breath, fever, and difficulty breathing with physical exertion. The disease is diagnosed based on the presence of these symptoms in conjunction with x-ray assessments of dust-induced lung damage.

### HOW CAN WORKERS BE PROTECTED?

Because of the high risk for silicosis in sandblasters and the difficulty in controlling the hazards, NIOSH has recommended that silica be banned for this use and that less hazardous materials be used in blasting operations.

### WHAT PRECAUTIONS CAN REDUCE THE RISK?

**If employers fail to substitute less hazardous blasting materials for silica**, the following precautions should be taken to protect workers:

- Blasting should be done in automatic blast-cleaning machines or cabinets which permit workers to

operate the machinery from outside using gloved armholes.

- Sandblasters should practice good personal hygiene to prevent unnecessary exposure. Workers should wash their hands before eating, drinking, or smoking; should not eat, drink, or use tobacco products in the blasting area; and should park their cars where they will not be contaminated.
- Workers should wear washable or disposable protective clothes and should shower and change before leaving the worksite. The air in the work environment should be monitored to measure worker exposure.
- When exposures cannot be kept below the NIOSH Recommended Exposure Limit (REL), proper respiratory protection should be used.
- Medical examinations, including periodic x-rays, should be provided to all workers who are potentially exposed.
- Warning signs should be posted to mark areas contaminated with crystalline silica.
- Worker training should include information on health effects, work practices, and protective equipment for crystalline silica.
- All cases of silicosis should be reported to state health departments and the Occupational Safety and Health Administration (OSHA) or the Mine Safety and Health Administration (MSHA).

### MORE INFORMATION

The information contained in this document is a summary of the key points in the Alert. For copies of the Alert (publication number DHHS (NIOSH) 92-102), write or fax requests to:

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For more information on this or other occupational safety and health concerns, call 1-800-35-NIOSH (toll-free). The NIOSH toll-free information system provides convenient access to NIOSH and its information systems.