

Respirable Crystalline Silica in Construction Workplaces



Sample Employee Training Presentation
Developed by OSHA, 2018



Respirable Crystalline Silica in Construction Workplaces

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What You Will Learn



- What respirable crystalline silica is

- How employees are exposed



- Health effects from breathing respirable crystalline silica

What You Will Learn



Silica standard



Workplace protections



What You Will Learn

Medical surveillance



Competent person



Crystalline Silica



Crystalline Silica Is Found In Many Construction Materials



Respirable Crystalline Silica



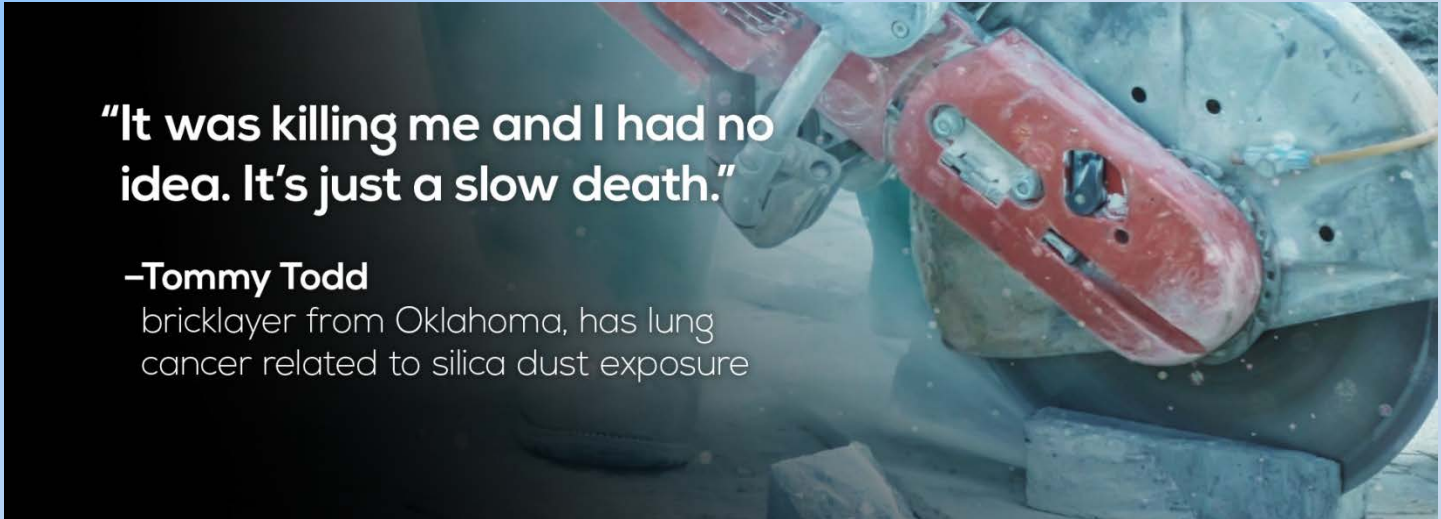


Workplace Tasks with Exposure

Employers must train employees on tasks in their workplace that can expose them to respirable crystalline silica

Health Hazards of Silica

- Silicosis
- Lung cancer
- Chronic obstructive pulmonary disease (COPD)
- Kidney diseases
- Autoimmune diseases



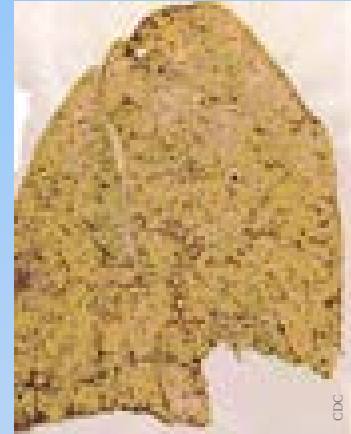
"It was killing me and I had no idea. It's just a slow death."

–Tommy Todd

bricklayer from Oklahoma, has lung cancer related to silica dust exposure

Health Hazards - Silicosis

- Three types:
 - o Chronic
 - o Accelerated
 - o Acute
- Permanent
- Can be debilitating or deadly



Healthy Lung

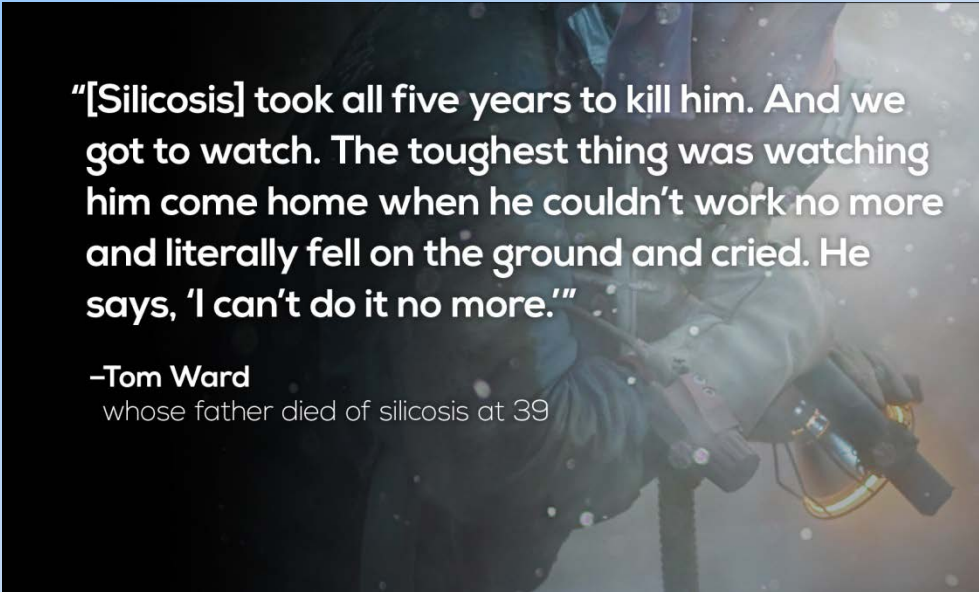


Silicotic Lung



Symptoms of Lung Diseases

- Sometimes, no symptoms in early stage of disease
- Coughing and shortness of breath
- Fever, weight loss, exhaustion, and coughing up blood



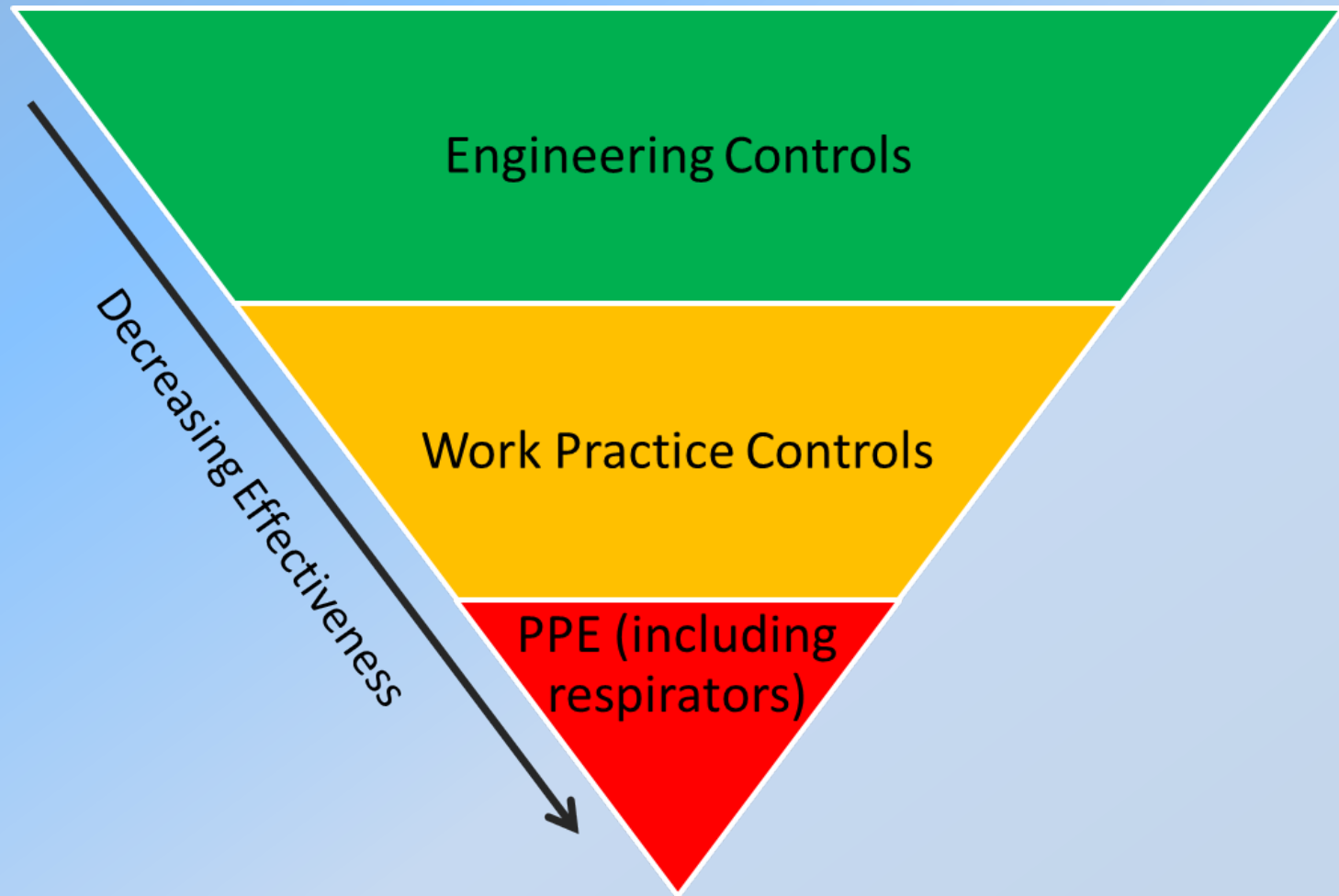
"[Silicosis] took all five years to kill him. And we got to watch. The toughest thing was watching him come home when he couldn't work no more and literally fell on the ground and cried. He says, 'I can't do it no more.'"

—Tom Ward

whose father died of silicosis at 39

Protecting Employees

Hierarchy of Controls



Engineering Controls

Cutting block
without engineering controls



Cutting block using water to
control the dust

Engineering Controls

Grinding mortar without
engineering controls



Grinding mortar using a
vacuum dust collector

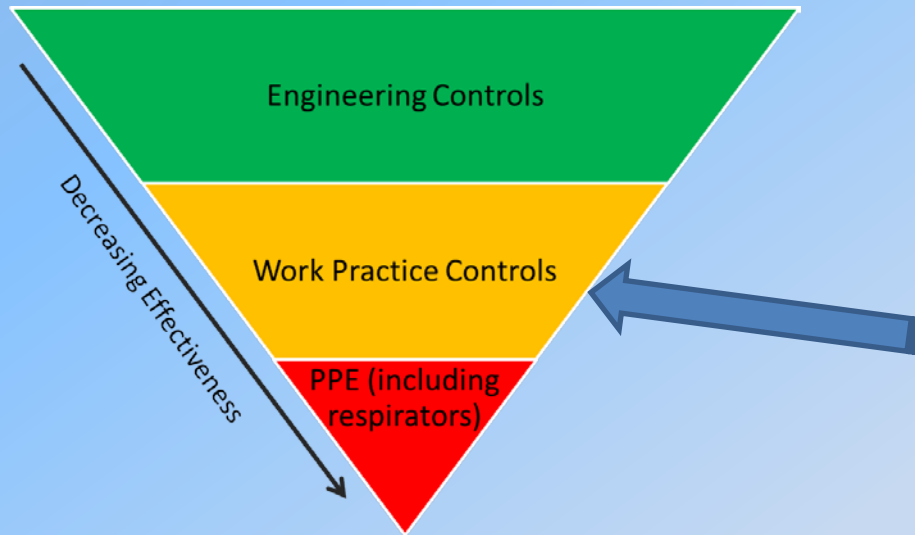
Engineering Controls

Employee protected inside the cab of heavy equipment used for demolition

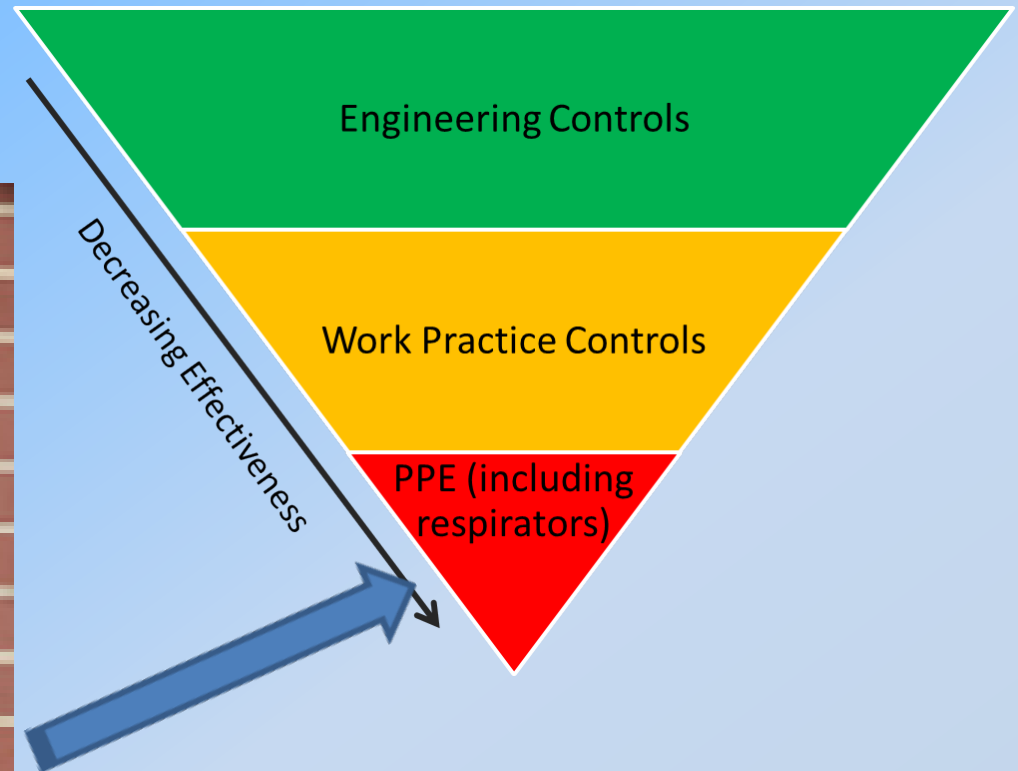


Work Practice Controls

Example: Fixing controls that are not working properly



Respirators



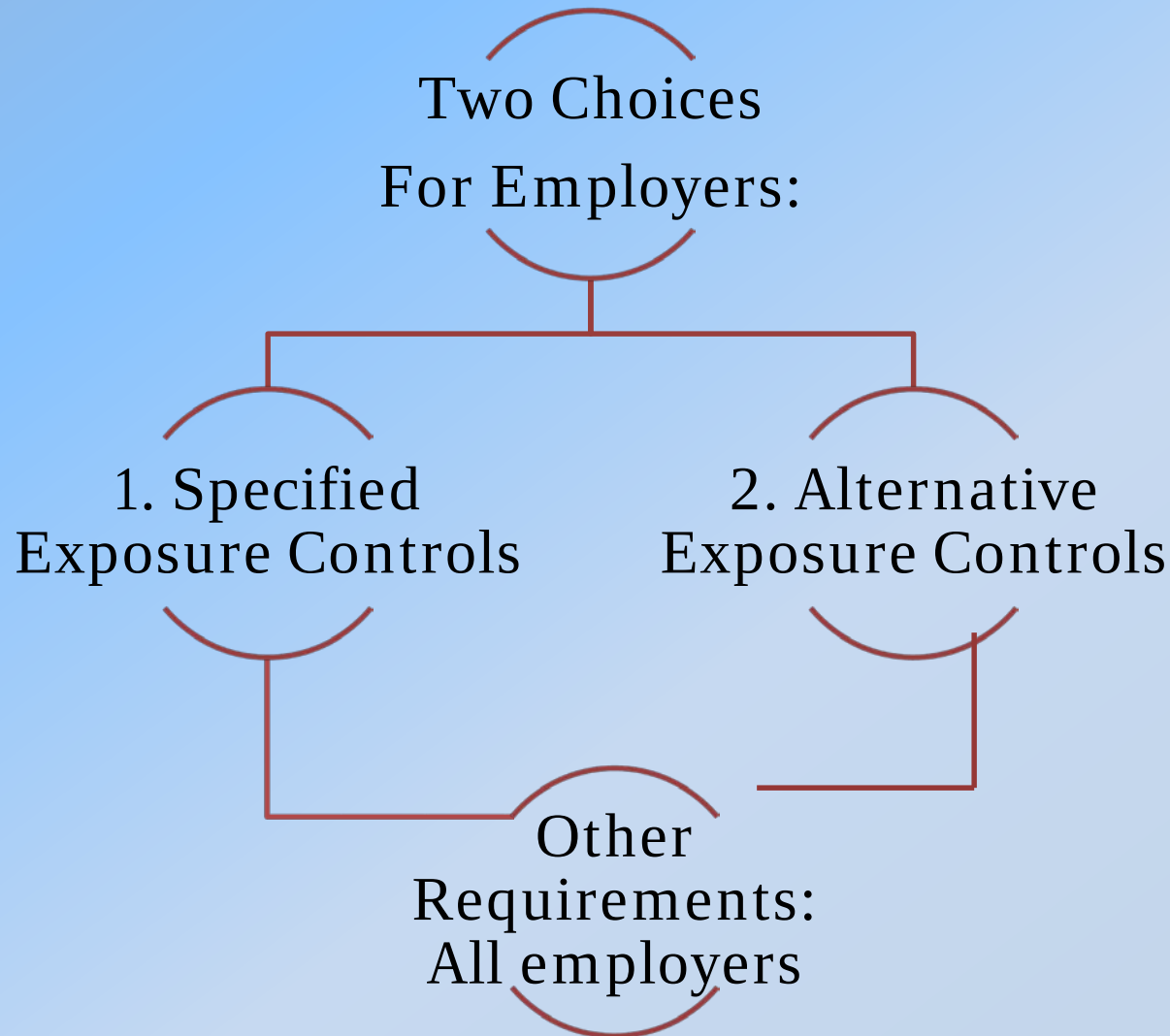


Specific Protections in This Workplace

Employers must train employees on workplace-specific:

- Engineering controls
- Work practice controls
- Respiratory protection

Respirable Crystalline Silica Standard for Construction



Specified Exposure Control Methods: Table 1

Table 1:
Handheld power saw



Table 1:
Handheld grinder for uses
other than mortar removal





Example of a Table 1 Entry

Equipment / Task	Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum APF	
		≤ 4 hr/shift	> 4 hr/shift
Stationary masonry saws	Use saw equipped with integrated water delivery system that continuously feeds water to the blade. Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions.	None	None



Example of a Table 1 Entry

Equipment / Task	Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum APF	
		≤ 4 hr/shift	> 4 hr/shift
Handheld power saws (any blade diameter)	Use saw equipped with integrated water delivery system that continuously feeds water to the blade.		
	Operate and maintain tool in accordance with manufacturers' instruction to minimize dust - When used outdoors - When used indoors or in an enclosed area	None APF 10	APF 10 APF 10



List of Table 1 Entries

- Stationary masonry saws
- Handheld power saws
- Handheld power saws for fiber cement board
- Walk-behind saws
- Drivable saws
- Rig-mounted core saws or drills
- Handheld and stand-mounted drills
- Dowel drilling rigs for concrete
- Vehicle-mounted drilling rigs for rock and concrete
- Jackhammers and handheld powered chipping tools
- Handheld grinders for mortar removal (tuckpointing)
- Handheld grinders for other than mortar removal
- Walk-behind milling machines and floor grinders
- Small drivable milling machines
- Large drivable milling machines
- Crushing machines
- Heavy equipment and utility vehicles to abrade or fracture silica materials
- Heavy equipment and utility vehicles for grading and excavating



Alternative Exposure Control Methods

- Permissible Exposure Limit (PEL)

50 Micrograms per Cubic Meter of Air
($\mu\text{g}/\text{m}^3$)

Averaged over an 8-hour work day

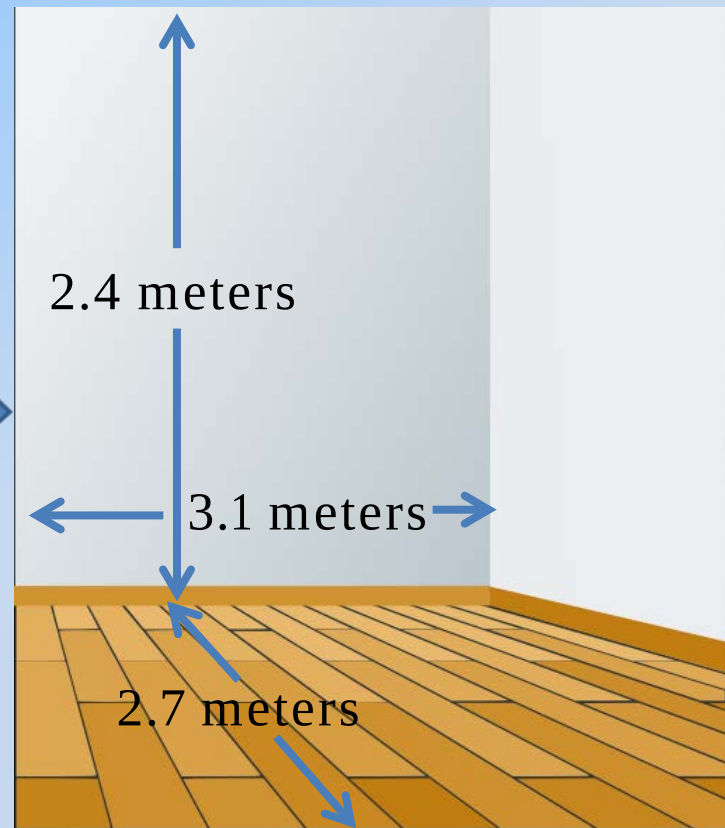
Perspective on PEL

1,000 μg in the air of this room = 50 $\mu\text{g}/\text{m}^3$

1,000 μg of silica



20 cubic meters of air



Alternative Exposure Control Methods – Exposure Assessment

Employers must:

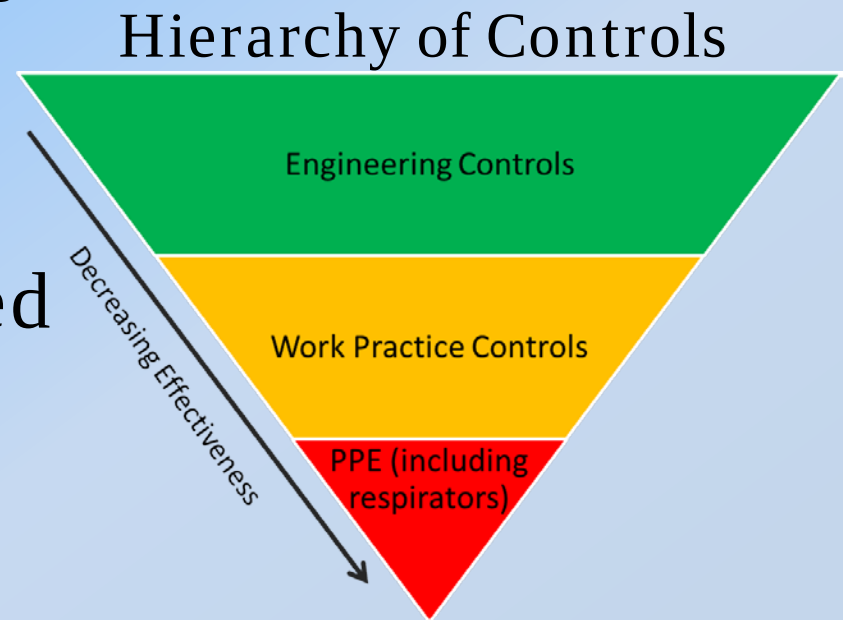
- Determine exposures
- Give employees results
- Let representatives observe



Alternative Exposure Control Methods – Methods of Compliance

Employers must select:

- Engineering controls
- Work practice controls
- Respirators, if needed



Respiratory Protection

Employers must:

- Provide respirators if needed
- Follow the respiratory protection standard



Housekeeping



When cleaning silica dust, avoid:

- Dry sweeping/brushing
- Compressed air without a ventilation system to capture the dust



Housekeeping

Employers must let employees know which housekeeping methods:

- Must be used in the workplace
- Must not be used in the workplace

Written Exposure Control Plan



Employers must:

- Prepare and implement plan addressing:
 - Exposure sources
 - Controls
 - Housekeeping
 - Restricting access
- Review plan yearly
- Make it available

Competent Person

- Identifies and minimizes silica hazards
- Employees must know the competent person



Medical Surveillance

- For employees who must wear a respirator under the silica standard for 30 or more days/year
 - Offered:
 - o Within 30 days of assignment
 - o Every three years



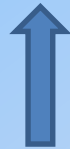
Medical Exams



- Medical and work history
- Physical exam
- X-rays



Medical Exams



Lung function test

Tuberculosis (TB test)



Why Medical Exams are Important



Find disease or
increased sensitivity
to silica exposure

Determine fitness to
use respirator



Department of Labor/Shawn T Moore

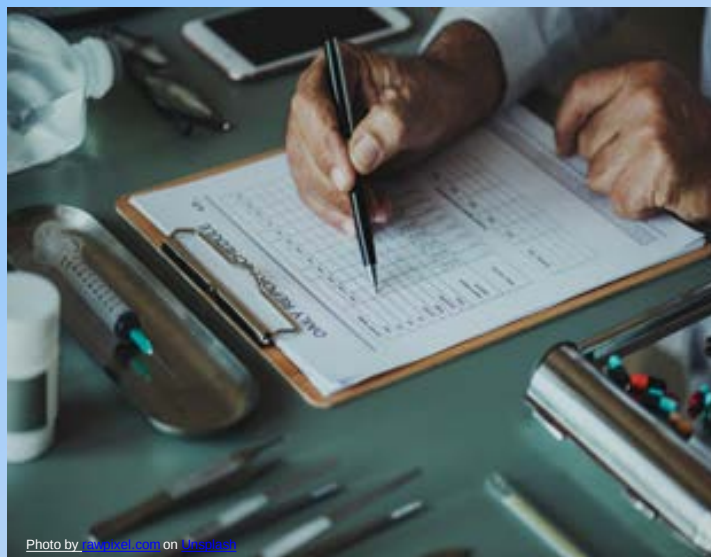
Medical Report for the Employee



- Medical conditions
- Recommended limitations on respirator use and exposure to silica
- Recommendation for specialist exam
- **Only goes to the employee**

Medical Opinion for the Employer

- Only medical info included:
 - Recommended respirator limitations
- Additional information requiring employee consent:
 - Recommended exposure limitations
 - Recommendation for specialist exam



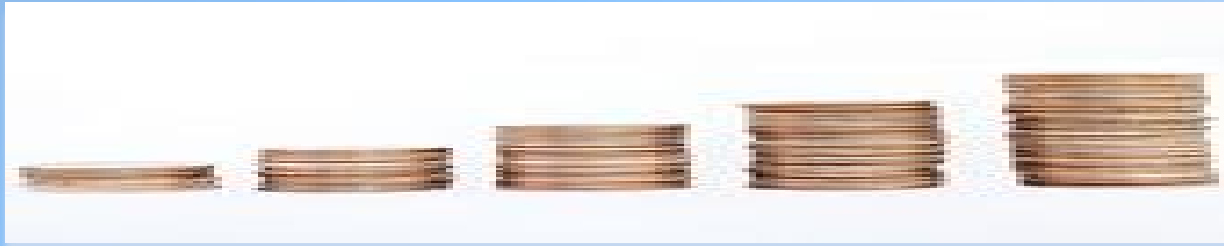


Employee's Copy of the Employer's Written Medical Opinion

*Written
Medical
Opinion*

- Employees also get a copy
- Proof of exam for future employers

Exams at No Cost to Employees



Employer covers costs of:

- Exams
- Tests
- Time spent traveling and getting exam

Other Training

- Hazard communication program
- Respiratory protection program



Copy of the Standard

Employers must:

- Make a copy of the standard available
- At no charge



Recordkeeping



Photo by [Andrew Pons](#) on [Unsplash](#)

Employers must:

- Keep medical and exposure records
- Make them available

More Information



www.osha.gov/silica/