

Just the Facts...

Asbestos: The Clinical Effects

Introduction: Asbestos is a general term used to describe 6 distinct naturally occurring fibrous mineral silicates. Asbestos is resistant to both acid and heat, and as a result has been widely used in industrialized countries. Common uses have included insulation around pipes and furnaces, as a strengthener in concrete, floor tile and siding, as a component in brake shoes and as an additive in paints. Outdoor air in all large cities contains some level of asbestos, either naturally occurring or as a result of previous commercial use. The Occupational Safety and Health Administration (OSHA) has established acceptable airborne levels for the work environment. If levels exceed these established standards, medical surveillance and the use of Personnel Protective Equipment (PPE) may be required.

Health Effects

Historically, exposure to high levels of airborne asbestos dust has been associated with a medical condition known as asbestosis, a form of chronic lung disease. Current OSHA guidelines are intended to protect workers from developing this debilitating disease. Asbestos exposure is also associated with lung cancer and mesothelioma, a cancer of the lining of the lung and pleural cavity.

Short term (or acute) effects from exposure to asbestos can include shortness of breath, chest or abdominal pain, and irritation of skin and mucous membranes.

Long term (or chronic) effects can occur as long as 20 to 30 years after exposure and include asbestosis, lung cancer and mesothelioma. The likelihood of developing these diseases is dose dependent, with longer exposures and exposures to higher concentrations increasing risk. Asbestos workers who smoke are 10 times more likely to develop lung cancer than similarly exposed non-smokers. The importance of stopping smoking for asbestos workers cannot be overstated.

Signs and Symptoms

Acute exposures: shortness of breath, chest or abdominal pain, and irritation of skin and mucous membranes.

Chronic or delayed effects: shortness of breath, dry cough, broadening and thickening of the ends of the fingers, bluish discoloration of the skin. Testing may reveal reduced pulmonary function tests, and chest x-ray changes (pleural thickening and plural plaques).

Onset of Symptoms

Acute symptoms are due to the irritant effects of the fibers and occur immediately after exposure. Chronic effects may not become evident until after 20 or 30 years.

Prevention

Prevention is based on reducing or eliminating soldiers, civilians, and their dependents exposures to asbestos to levels below the OSHA and Army standards. We control these exposures by following the requirements outlined of the Army Asbestos Management Program and OSHA asbestos standards. When airborne particles exceed standards, the use of proper engineering and work practices along with the proper wear of appropriate Personnel Protective Equipment (PPE) will prevent illness and injuries. In addition, care must be taken to avoid bringing asbestos dust into the home environment.

Medical Surveillance

The purpose of medical surveillance is to assure that workers are capable of safely performing their job and to identify any work related illnesses or injuries at a time when intervention can prevent or reduce permanent injury. Workers being assigned to an occupation with exposure to airborne concentrations of asbestos at or above the OSHA Permissible Exposure Limit (PEL), or Excursion limit for more than 30-days per year or where the employee will be performing asbestos abatement as outlined in OSHA 1926.1101 for more than 30-days per year, will have preplacement, annual and termination medical examinations.

a. Preplacement examinations include a comprehensive medical and work history to document symptoms of respiratory disease, smoking history, and any past exposure to asbestos, a physical examination with emphasis on respiratory, cardiovascular, and gastrointestinal systems, a chest x-ray and pulmonary function tests.

Additionally, an OSHA respiratory disease standardized questionnaire will be completed if the worker will be required to use a respirator.

b. Annual examinations.

Annual exams are the same as the preplacement except:

(a) Chest x-ray evaluations will be conducted at the discretion of the physician for construction and abatement workers as discussed in 29 CFR 1926.1101.

(b) Chest x-ray evaluations for all other workers will be conducted every 5 years until the elapsed time since first exposure reaches 10 years or greater. Then the frequency of chest x-ray evaluation will be every 2 years for workers between 35 and 44 years of age, and yearly for workers 45 years or greater.

c. Termination of exposure or employment examinations. Personnel who are no longer exposed to asbestos will be removed from the asbestos medical monitoring program and will receive a medical evaluation within 30 calendar days before or after termination of employment or asbestos exposure. No examination is required if the employee has undergone an examination within the past year.

Definition and Terms

Asbestos: General term used to describe six distinctive varieties of fibrous mineral silicates; chrysotile, amosite, crocidolite, tremolite, anthrophyllite, and actinolite. Asbestos is a naturally occurring fibrous material that is resistant to heat and acid.

Asbestosis: A form of lung disease (pneumoconiosis) caused by inhaling large quantities of asbestos fibers.

Environmental Differential Pay (EDP): Additional pay given to workers who are exposed to unusually large environmental risks without proper protection. An example is workers working in areas of high heat and humidity. The Commander determines EDP based on current law and Office of Personnel Management standards determines EDP. EDP is only for WG employees.

Latent Period: A period where the effects of an exposure are not apparent. Effects become apparent at a time remote from the actual exposure. A latent period is common to both cancer causing and infectious agents.

Hazardous Duty Pay (HDP): Additional pay given to workers who are exposed to unusual risks due to their professions without proper protection. An example is workers working directly with explosives. HDP is only for GS and GM employees.

Personnel Protective Equipment (PPE): Equipment worn by an individual to protect them from environmental hazards. Gloves, coveralls and respirators are common forms of PPE.

Respiratory Protection: The use of a respirator to protect the worker. Respirators are devices that provide clean air to the worker. The respirators clean the air using a filter or it can provide an external source of clean air. Respirators are designed to protect the workers from airborne contaminants. Respirators can range from a disposable dust/mist mask to Self-contained breathing apparatus (SCBA) respirators. Respirators must be NIOSH or Army approved. An M-40 Protective mask is an example of a respirator intended to protect the soldiers from chemical warfare agents; however, it is not currently NIOSH approved for use to protect from asbestos and cannot be used for this purpose.

References:

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AR 200-1, Environmental Protection and Enhancement, 21 February 1997

AR 420-79, Buildings and Structures, 10 October 1997

TB MED 502, The Army Respiratory Protection Program, February 1982

TB MED 509, Spirometry in Occupational Health Surveillance, 24 Dec 1986

TB MED 513, Occupational and Environmental Health, Guidelines for the Evaluation and Control of Asbestos Exposure, 15 December 1986

Public Works Technical Bulletin 420-70-8, Installation Asbestos Management Program, 23 March 1998

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Title 29 CFR Part 1926.1101, Occupational Safety and Health Standards (Construction Industries), Asbestos, Revised August 1994

Title 29 CFR Part 1915.1001, Occupational Safety and Health Standards (Maritime Ship Repair Industries), Asbestos, August 1995

Title 29 CFR 1910.134, Respiratory Protection Standard, 8 Jan 1998 www.osha-slc.gov/OshStd_data/1910_0134.html