Mount Sinai Children's Environmental Health Center

Asbestos Tabs

- **What is Asbestos?**
- **How does Asbestos exposure occur?**
- **How can Asbestos effect health?**
- **Can Asbestos exposure be diagnosed?**
- **Is there a treatment for Asbestos exposure?**
- **How can Asbestos exposure be prevented?**

Medical References

Asbestos Tabs

What is Asbestos?

Asbestos is the name given to a group of six naturally occurring fibrous minerals. Asbestos minerals are mined in nations around the world, notably Canada, Russia, South Africa and Brazil.

Asbestos is a remarkable material. It does not burn, it has great tensile strength, and it provides excellent thermal and acoustic insulation. For these reasons, it was used widely in building construction in the United States, especially in the 1950s and 1960s, and it is still used extensively today in many developing nations.

Unfortunately, asbestos is also an extraordinarily dangerous material, a powerful human carcinogen.

Because of its hazards to human health, virtually all new use of asbestos has ceased in the United States. A combination of government regulation and market pressures brought about the end of asbestos. These actions stemmed in large part from the landmark studies on asbestos conducted at Mount Sinai School of Medicine by the late Dr. Irving J. Selikoff and his colleagues.

Millions of tons of asbestos are still present today in schools, homes and other buildings - a legacy of the past.

How does Asbestos exposure occur?

Despite the recent decline in new use, enormous amounts of asbestos remain in buildings throughout the United States and pose as future threats to health. Public health officials have been challenged to develop a systematic approach to asbestos control that enables parents, pediatricians, and school officials to take care of the problem in a sensible, non-alarmist manner.

In 1988, the EPA surveyed public and commercial buildings and found that asbestos-containing materials were present in at least 700,000 public and commercial buildings in all areas of the Untied States. About 500,000 of these buildings contain at least some damaged asbestos.

Asbestos in American schools and other buildings is a major environmental hazard. As building materials containing asbestos age, they become increasingly fragile and friable and release fibers into the air. These microscopic airborne fibers can remain suspended in the air for hours or even days and are readily inhaled. Spray-on asbestos that was applied as insulation to ceilings and beams is the form most likely to become friable.

Any disturbance will increase the release of asbestos fibers. The source of these disturbances include routine building maintenance, water damage, renovation, reconstruction, or demolition. Today, as tens of thousands of buildings in the United States containing asbestos age, and as plans are made for their renovation and demolition, grave potential exists for the widespread exposure of children and adults.

Table 1: Sources of Asbestos Exposure in Schools, Public Buildings, and Homes*

Uses in Schools and Public Buildings	**Residential Uses**
Boilers and heating vessels	Duct insulation
Cement Pipe	Fire-protection panels
Clutch, brake, and transmission components	Artificial logs or ashes for fireplaces
Conduits for electrical wire	Furnace-insulating pads
Corrosive chemical containers	Fuse-box liners
Electrical Motor components	Heat – register tape and insulation
Heat-protective pads	Joint compounds
Laboratory furniture	Patching plaster
Paper Products	Pipe or boiler insulation
Pipe covering	Sheet vinyl or floor tiles
Roofing products	Shingles
Sealants and coatings	Textured acoustical ceiling
Textiles	Underlayment for sheet flooring
Theater curtains	

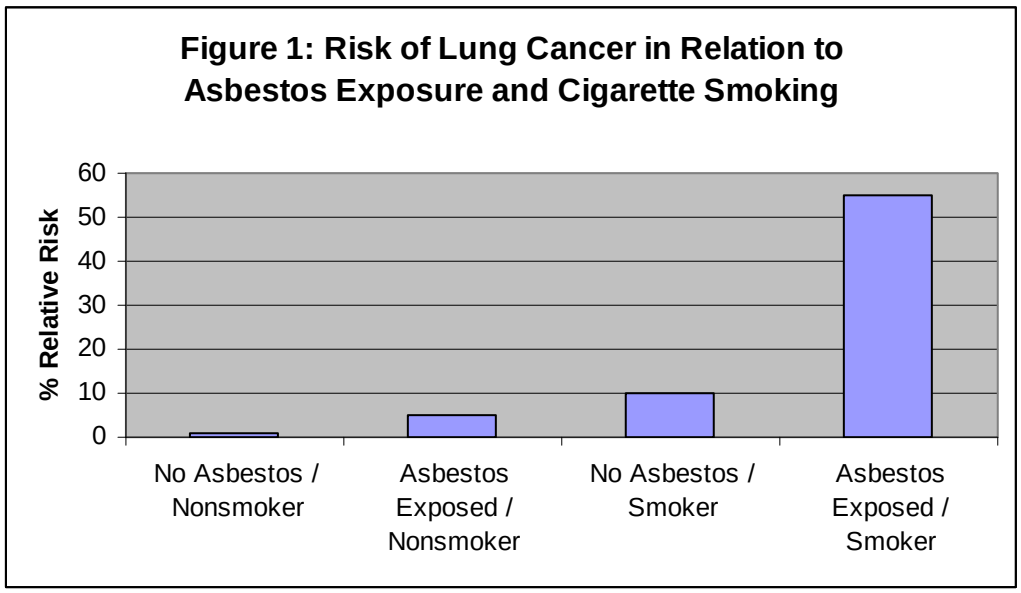
* Data from the Agency for Toxic Substances and Disease Registry, U.S. Public Health Service, 1990.

How can asbestos effect health?

A proven human carcinogen, asbestos can cause a number of different types of cancer. Any exposure involves some risk; no safe threshold level of exposure has been established. Parents should, however, be reassured by the fact that the degree of risk is directly correlated with the degree of exposure. The risk associated with low levels of exposure or with brief, one-time encounters is much less than that resulting from regular or pro-longed exposures.

The two most important cancers caused by asbestos are malignant mesothelioma, a cancer of the inner lining of the chest or abdomen, and lung cancer. Asbestos can also cause cancer of the throat, larynx, and gastrointestinal tract.

A strong interaction has been found between asbestos and cigarette smoking in the causation of lung cancer. Persons who are exposed to asbestos and who do not smoke have five times the rate of lung cancer when compared to an unexposed individual. By contrast, people who are exposed to similar levels of asbestos and who also smoke have more than fifty times the rate of lung cancer (see figure 1). This powerful interaction is another reason why children and adolescents should not begin to smoke cigarettes.



Exposure to large doses of asbestos can also lead to asbestosis, a progressive, fibrotic disease of the lungs. Asbestosis is normally seen among workers exposed occupationally and is rarely seen in children who generally experience much lower levels of exposure.

Children are at increased risk of developing disease after asbestos exposure when compared with adults. Because of their long life expectancy when compared with adults, children have many years in which to develop cancers triggered by early exposures. They also tend to be much more physically active than adults, and therefore breathe at higher rates and more often through their mouths. Finally, they spend much of their time close to the floor, where dust and asbestos fibers accumulate. These factors combine to make children uniquely vulnerable to asbestos exposures.

How is an Asbestos exposure diagnosed?

Since there are no acute symptoms of asbestos exposure it is often impossible to diagnose at the time an exposure occurs. Medical screening of children who have been exposed to asbestos in schools and other buildings is *not* recommended, because asbestos exposure (except for very heavy exposure in an occupational setting) does not produce any detectable physical damage or X-ray changes until twenty, thirty, forty or more years after exposure.

What treatments are available for Asbestos exposure?
Since asbestos exposure does not result in acute symptoms, there is no treatment for asbestos exposure. There is also currently no treatment for the removal of asbestos fibers from the lungs. If diseases such as lung cancer or mesothelioma develop as a result of asbestos exposure later in life, these diseases should be treated by an oncologist. There is currently no treatment for asbestosis.

It is important to recognize that exposure to small amounts of asbestos is unlikely to lead to the development of disease. Prolonged exposure to asbestos increases the risk that these diseases will develop. If an exposure is discovered early and terminated, it is probable no disease will result.

If you suspect that your child has been exposed to asbestos, the most effective method of preventing the development of asbestos-related disease is to deal with the source of exposure. Direct any further energy towards teaching your child the importance of not becoming a smoker. As Figure 1 (in the *How does asbestos effect health?* section) indicates, smoking can lead to a 50-fold increase in the chance of developing asbestos-related lung cancer.

How can asbestos exposure be prevented?
How does a parent determine whether a building contains asbestos? How do you ascertain whether the asbestos in a building poses a hazard to your children? And if asbestos is found, what can parents, school officials, and pediatricians do to minimize the risk to children?

The first point to bear in mind is that you are not alone. The medical community across the United States, the EPA, state health departments, and Congress have directed enormously detailed attention to the problem of asbestos in schools and other buildings. They have considered the risks most carefully, and they have developed blueprints for assessing and then minimizing the hazard. Together these agencies and organizations have worked together to come up with a unified plan based on one principle: *all efforts to control asbestos should focus on the prevention of exposure*.

To this end, in 1984 Congress passed the Asbestos Hazard Emergency Response Act (AHERA). The fundamental principle behind AHERA is that as long as asbestos in a building is kept from becoming airborne, it poses no threat to human health. Under AHERA, schools are required to conduct visual inspections of school facilities searching for any sources of asbestos-containing materials. These inspections must be undertaken by properly qualified professional inspectors. AHERA lays down specific requirements for the training and certification for these inspectors. Any findings during these inspections must be made public as must plans indicating how the school will deal with the source of exposure.

If asbestos-containing materials are found in a building (school, municipal or otherwise), AHERA requires the development of a written plan to deal with the source and prevent exposure. A qualified consultant is responsible for developing this plan, the goal of which is to prevent any asbestos exposure. Any plan will include one of three options for dealing with asbestos, *Removal*, *Enclosure*, or *Operations and Maintenance (O&M).*

Removal: The most obvious and direct approach for dealing with asbestos in buildings, removal provides a permanent solution to an asbestos problem. It is important, however, to emphasize the fact that removal is often not the appropriate mechanism for dealing with asbestos materials. If removal is not done properly, it can result in the wide dispersal of previously contained asbestos fibers, producing a significant health hazard not only to the workers removing the materials, but also to building occupants. *Asbestos removal, if not done properly, can do more harm than good*. If asbestos removal is required because the asbestos-containing materials are friable, easily accessible, or about to be disturbed, it is essential that the removal be done by a properly certified contractor.

Enclosure: Enclosure of asbestos in a building involves the construction of airtight walls or drop ceilings over asbestos surfaces. All enclosure of asbestos-containing materials must proceed under the strict supervision of a certified professional. It is important that the performance of enclosure work be noted in the building log, so that in the future, workers and school or building officials will know that asbestos is present beneath the enclosure barrier.

Operations and Maintenance (O&M): An O&M program is used to manage asbestos that does not pose an immediate hazard. In an O&M program, no immediate action is taken with regards to the asbestos-containing materials, but a plan is enacted to carefully monitor the materials moving forward. Special precautions must be taken to ensure that the day-to-day management of the building is carried out in a manner that minimizes release of asbestos fibers into the air. The EPA has developed strict guidelines for O&M programs, including instructions for the cleaning, maintenance, renovation, and general operation of buildings containing asbestos. While O&M programs do not remove the source of asbestos, when properly implemented they can lead to the smallest risk of asbestos exposure.

Asbestos is not found as commonly in private homes in the US as it is in schools, apartment buildings, and public buildings. Nevertheless, asbestos is present in many homes in the as a legacy of the past. If you are concerned about an asbestos exposure in your home, contact a certified contractor to do an evaluation. Make sure to ask any prospective contractors for proof of their certification. The contractor will examine your house for sources of asbestos exposure and test any questionable materials. If he or she finds a source of exposure, they will deal with the source in one of the three ways detailed above.

I. References

Landrigan PJ, Needleman HL, Landrigan M. *Raising Healthy Children in a Toxic World*. Emmaus, PA; 2001

Etzel RA, ed. *Pediatric Environmental Health*. 2nd ed. United States: American Academy of Pediatrics; 2003