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THE ASBESTOS PROBLEM

An asbestos curtain was once the very symbol of safety and security. When primitive stage lighting made the risk of theater fires a constant worry, the presence of a fireproof curtain reassured audiences that a blaze could be contained long enough for them to escape it. Now the tables are turned; disease caused by asbestos has become a matter of serious concern.

Since antiquity, asbestos had been made into such items as permanent lamp wicks or novelty fabrics that would not burn. But early in this century, the use of asbestos grew like wildfire (so to speak). A potential health hazard was suspected very early, but it wasn't until the 1960's that its full magnitude became evident.

THE MATERIAL. Asbestos is a family of similar minerals that all occur naturally as a kind of soft rock made up of compressed fibers. One of the best insulators known, it protects what it covers from heat, corrosion, or electrical damage. It is also strong and durable. The mineral fibers can be handled in ways similar to vegetable fibers; they can be spun, made into felt, or bonded with other substances to form durable materials.

By now there are 3,000 uses of asbestos. Insulation for buildings is made from the material; huge amounts have also been used to insulate boilers and pipes in ships; automobile brake linings and clutch plates have been made of asbestos since the early 1900's. Asbestos has been incorporated into cement to strengthen it for use in pipes and other formed objects. Asbestos filters are used in the manufacture of some imported wines. For many years, hair dryers were insulated with the material. Until recently, asbestos was commonly incorporated into the spackling and taping compounds used for dry-wall construction. From 1946 to 1973, asbestos was added to coatings that could be sprayed onto walls or other structures in lieu of plastering them.

In all, some 90 million tons have been used in the United States since the beginning of this century, and by its end, according to one estimate, some half a million people will have died as a result of their exposure to asbestos.

THE PROBLEM: Asbestos produces disease only when it is inhaled (or possibly swallowed). Minuscule fibers of the material (some too small to be seen with a standard microscope) are drawn into the lungs. There the fibers are taken up by cells responsible for cleaning the air passages, but these fibers cannot easily be broken down for removal. Instead, the fibers remain in place or migrate slowly toward the periphery of the lungs. Some may even travel across the diaphragm into the abdominal cavity (peritoneum), whereas others probably arrive there after being swallowed.

It appears that asbestos creates problems solely because of its physical properties, not because of its chemical nature. The tiny size of asbestos particles is important; if they were larger, the trouble



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ments would settle out in the large airways, which are better equipped to remove foreign substances than the very small ones. The shape also matters: needle-like dimensions, which are typical of the asbestos crystal, appear to increase its ability to cause disease. Unfortunately many of the possible substitutes for asbestos, such as certain newer types of fiberglass, acquire these characteristics in the process of being developed into better insulators. In other words, the desirable properties of asbestos as an insulating material are also the ones that make it dangerous. Even so, it appears so far that asbestos is more potent in causing disease than other effective insulating substances, such as fiberglass and rockwall.

Thirty or so years after asbestos dust is inhaled, but sometimes much sooner (depending on dose), it begins to cause several types of detectable disease

(1) Asbestosis is a sometimes fatal condition, that results from significant, but not necessarily heavy exposure. It hardly ever occurs except in people who have worked with asbestos or with products containing it. This is, however, the most common disease produced by exposure to the material, though not the most common cause of death, which is lung cancer. Asbestosis is a kind of scarring process, one that takes place within the lung tissue itself or on its outer surface. Asbestosis causes the air spaces to become smaller or obstructed, and the lung itself to become more rigid. There is no effective treatment to prevent or reverse the scarring. As a result, breathing is difficult, oxygen and carbon dioxide are poorly exchanged, and lung infections are easily acquired. This disease or its complications can progress, even without further exposure to asbestos.

Lung infections, such as pneumonia or bronchitis, are extremely threatening to people with asbestosis. They should be vigorously treated, usually with antibiotics, at the first sign of a respiratory infection. Stopping smoking is critical: cigarette smoke not only makes asbestosis more dangerous, difficult to live with, and hard to treat, it markedly increases the risk of lung cancer in anybody who has been exposed to asbestos.

(2) Lung cancer is extremely common among people who have worked with asbestos, many of whom smoke. For some unknown reason, the combination of cigarette smoke and asbestos is much worse than would be predicted by adding together the risks from each. Anyone who has been exposed to even small quantities of asbestos dust should do everything he or she can to stop smoking. The outlook for those who stop is much better than for those who continue. As is the case with all lung cancer, by the time symptoms occur, it is usually too late for curative treatment, and no good tests for earlier detection are available.

(3) Mesothelioma, several other types of cancer, occur mainly in people exposed to asbestos dust. These tumors arise from the membrane that lines the chest or abdominal cavity, and they are highly malignant. Although they are rare, mesotheliomas can occur even after a limited exposure to asbestos dust and may affect people who were not directly involved in handling the material, such as relatives of asbestos workers. A very long time — forty years or more — can elapse between exposure and the appearance of mesothelioma, although many cases appear earlier.

Some other types of cancer, occurring outside the lungs, also appear to be somewhat more common in people exposed to asbestos dust. A few other diseases may also be more common, and it appears that the suicide rate in former asbestos workers is as much as two to three times higher than in the general population.

WHAT TO DO? The asbestos situation raises two questions: What can individuals do to protect themselves and their families? What should we as a nation do to prevent further injury from exposure to asbestos?

Continued on back 5

The answer to the first question is reasonably straightforward for people who do not work with the material. Asbestos is only dangerous when it produces dust. Left undisturbed or bonded into durable slates, tiles, or other materials, it presents virtually no risk. But asbestos-containing insulation around pipes or boilers and in walls, wall coverings, or spackling compounds that are sawed, cut, sanded, or are exposed to damage from routine use, may give off considerable quantities of asbestos dust. Nobody should work with such materials unless he or she is adequately trained and is fully protected from inhaling the dust. Deteriorating asbestos materials should be removed, covered with an effective sealant, or enclosed under another covering. Expert advice is needed both to determine whether there is an asbestos problem in a given area and to choose the proper method for dealing with the hazard.

Spray-on wall coverings that contain asbestos present a special problem. This inexpensive technique was rarely used in homes but quite frequently in school construction. Water damage, heavy use, and occasionally vandalism have caused the coatings to begin disintegrating in some schools, and several states have begun programs to detect and correct the problem. Unfortunately such efforts are expensive and, all too often, underfunded.

People who work with asbestos and its products, including those who repair existing objects that contain the material or are covered with it — such as plumbers, shipyard workers, brake and clutch workers, construction workers — are entitled to protection from asbestos and the diseases it causes. They should be fully aware of the amount of asbestos dust that they breathe while they earn a living. Unfortunately, employers — both private industries and the government — have often been negligent, failing to inform employees about asbestos exposure or to protect them from it. Workers at risk of exposure should insist that the air they breathe be frequently sampled and analyzed by an appropriate method. Employers and workers should cooperate in bringing fiber counts in the air well below the current legal standard (2 million fibers per cubic meter), which is probably at least twenty times too high. Face masks and respirators are not as effective as ventilation control or improved handling, such as "wet processing."

The second question — what national action should be taken — is much more difficult to answer. There is no doubt that asbestos represents a major public health problem, one that extends beyond the large group of people who suffer from occupational exposure. Every possible way should be found to remove it from the human environment. But eliminating the substance from existing structures or from industrial applications may not be feasible for technical, economic, or political reasons. Meanwhile, there is controversy about the amount of asbestos exposure that is compatible with good health. Enforcing existing regulations, let alone more stringent ones, is difficult.

To date there has been no coherent, effective government program for dealing with the asbestos problem. Responsibility has fallen partly on the states and partly on several federal agencies. At a minimum, the federal government should be expected to take the initiative in developing a unified program to conduct research on asbestos diseases, measures to control exposures, and substitute materials. Technical advice and support should be offered to local control programs, and a policy should be developed for the future. Asbestos diseases become a medical problem only when it is too late to cure them. Preventing these diseases is a political challenge, not a medical one.

HIDDEN INGREDIENTS

Thousands of Americans every day consume a drug similar in structure to amphetamine ("speed") without knowing it. That sounds like a scare headline — but is in fact true. The drug in this case, is phenylpropanolamine — PPA for short — which is a common ingredient in dozens of cold and cough remedies of both the prescription and the non-prescription variety. (As such, PPA is no different from many other drugs that are consumed as ingredients in various cold remedies.) Recent articles in the British medical journal The Lancet point out that PPA has two actions which

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are potentially harmful for some people. First, it can cause elevation of blood pressure. As a decongestant, PPA acts by constricting blood vessels, and this effect upon vessels explains why it has produced blood pressure elevation even in otherwise healthy young adult volunteers. Second, as a nervous system stimulant, PPA — like amphetamine — can cause symptoms such as irritability, sleeplessness, and even hallucinations. These effects are apparently more common in children — not surprising. The point, of course, is that we should all ask about the ingredients in what we buy or take — and we should be aware of their potential side effects.

CHOLESTEROL — BAD OR NOT?

The Food and Nutrition Board of the National Research Council recently created an enormous stir in our nation's kitchens when they suggested that the dangers of dietary cholesterol may have been overstated. The suggestion was immediately attacked by many physicians (who did not hesitate to point out that none of the authors of the report were either heart specialists or epidemiologists) and many organizations, including the American Heart Association. And while the ensuing flap may have been interesting to the participants, the general public was understandably left questioning the standard advice of the past twenty years to eat less fat and cholesterol. As a guide to the confusion, we offer the following statements:

(1) No one disagrees that elevated cholesterol levels mean an increased risk for heart attack; for example, the famous Framingham Heart Study data — developed over twenty years of follow-up — indicate that a man with a total cholesterol of 260 (mg. per 100 ml.) has a risk for a heart attack three times that of a man whose count is under 195. The risk becomes five-fold at a cholesterol of 310.

(2) In recent years, the correlation between a total cholesterol level and the risk for heart disease has been somewhat muddled by the knowledge that not all the cholesterol reflected in the total count is bad; specifically, the form of cholesterol known as HDL (high density lipoprotein) is associated with a decreased risk for heart disease. Therefore, more information is now being gathered on the relationship between various levels of total cholesterol — and attempts to lower it — and corresponding levels of good versus bad cholesterol.

(3) The ultimate question involved in the dispute is one that has been debated for years — namely, whether or not it pays to cut down on dietary fat and/or cholesterol. Almost all would agree that if such dietary changes resulted in lowered "bad" cholesterol levels and/or elevated "good" cholesterol levels, such dietary intervention would be worthwhile. But there is evidence that diet does not always improve the cholesterol pattern. Again, almost all experts would agree that diet changes would be good for some people — especially those with a strong family history of premature heart disease, those with known heart disease, and those who are obese. And while these groups encompass many Americans — maybe a majority — it must also be admitted that there are other Americans who do not need to restrict dietary fats and cholesterol.

In short, the argument boils down to the problem of making sensible, generalized recommendations concerning the role of diet in changing blood cholesterol levels. Most experts in the field of heart disease have argued that since we do not need fat and cholesterol in large amounts (indeed, they can contribute to weight gain, if nothing else) and since strong evidence points to increased heart disease in general in populations that eat increased amounts of these substances, the prudent recommendation is to hedge our bets and lower the amounts of fat and cholesterol in our diets. Admittedly, this advice is not needed by some — but enough will benefit so that, in our judgment, this is still the best general advice to follow.

The goal of this Health Letter is to interpret timely health information, but its contents are not intended to provide medical advice for individual problems. The latter should be obtained from your physician. Unfortunately, we cannot respond to personal inquiries. The Harvard Medical School Health Letter is published monthly as a non-profit service of the Department of Continuing Education of Harvard Medical School. Please address all inquiries to: The Harvard Medical School Health Letter, 79 Garden St., Cambridge, Mass. 02138 (617 495-3234). Individual subscription \$15.00 per year. Single copies \$2.00 each. Bulk subscriptions at special reduced rates are available upon request. Second class postage paid at Boston, Massachusetts and additional mailing offices. USPS 071-3

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