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Hazards of asbestos in dentistry

Council on Dental Therapeutics
Council on Dental Materials and Devices

Asbestos is chiefly used in dentistry as a binder in periodontal dressings and as a lining material for casting rings and crucibles. Asbestos is a generic term for a number of hydrated silicate minerals which, under crushing or other processing procedures, separate into flexible fibers. There are many such minerals, including chrysotile, asmosite, crocidolite, anthophyllite, tremolite, and actinolite. Most asbestos is classified as chrysotile and it appears to be the most hazardous fiber in the group.

It has been documented that airborne asbestos is related causally to the development of pulmonary asbestosis and fibrosis,[1-3] lung cancer,[4-6] and pleural and peritoneal mesotheliomas.[7-9] Recent epidemiologic studies also have indicated that the chance of lung cancer developing in smokers exposed to airborne asbestos is greater than it is in nonsmokers.[10-12]

The potential danger to dental personnel in preparation of asbestos-containing periodontal packs is of sufficient concern that the Council on Dental Therapeutics will no longer consider such products as eligible for its Acceptance Program. Airborne asbestos may become hazardous during the mixing of these asbestos-containing periodontal dressings, particularly when large amounts are being prepared in poorly ventilated areas and when the powder is shaken prior to mixing.[13,14] Also, exposure to airborne fibers may occur in dental laboratories where asbestos is used to line casting rings or crucibles for casting machines and in general is kept in the laboratory in large rolls. Here, the danger lies in the tendency for personnel to carelessly cut sections off these rolls and thus release asbestos into the ambient air. The maximum permissible exposure of an employee to airborne concentrations of asbestos fibers over an eight-hour, time-weighted average has been established as five fibers (longer than 5μm) per cubic centimeter of air.[15] On July 1, 1976, the maximum will be reduced to two such fibers per cubic centimeter of air. This is of importance to the dentist operating his own laboratory as well as to the employees in commercial dental laboratories. To prevent release of fibers into the air, asbestos should be handled, applied, removed, cut, or otherwise worked in a wet state to reduce the emission of airborne asbestos. Personnel should be aware that soaking of asbestos liners in water releases fibers into the community sewage line and, therefore, suitable trapping of such wastes is recommended.

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There is no apparent health danger from inhalation to patients for whom asbestos-containing periodontal dressings are used, since the fibers cannot be appreciably released from the dressings once they are mixed and applied. In addition, present information indicates that there is little danger to patients should the dressings be accidentally swallowed. According to the Food and Drug Administration, "evidence concerning the possible hazard from ingestion of asbestos particles is contradicting and inconclusive."[16]

There is, however, evidence that parenteral administration of asbestos in animals can result in local malignancies, malignant mesothelioma, and dissemination of fibers in lymph nodes, spleen, kidneys, and brain.[17-19] Therefore, the Council on Dental Therapeutics is concerned about the asbestos concentration of filters used for preparing drugs that may be injected parenterally by dentists. Such filters may release asbestos particles into the solution and thus be injected into the patient. The Food and Drug Administration is surveying the industry for information concerning the use of such filters.

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