

THE BENDIX CORPORATION
CORPORATE ENGINEERING STAFF
SOUTHFIELD, MICHIGAN

HEALTH-HAZARDS OF ASBESTOS -
A REVIEW OF THE MEDICAL LITERATURE

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cc

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EXECUTIVE SUMMARY

HEALTH-HAZARDS OF ASBESTOS

A. CURRENT MEDICAL KNOWLEDGE

1. Nature of Asbestos-Related Diseases

Present medical knowledge associates asbestos with three primary diseases: Asbestosis; Bronchogenic (lung) Cancer; and Mesothelioma, a rare form of cancer.

All three diseases affect the lungs and in the case of mesothelioma, the abdominal cavity may also be affected. Asbestosis can cause death but it is not always fatal, bronchogenic cancer is fatal and mesothelioma is the most deadly of them all.

2. Is there a safe exposure level?

There is general agreement that the risk of developing one of the asbestos-related diseases is positively correlated with the intensity and duration of exposure to asbestos dust.

However, there is no conclusive proof of a safe threshold level of exposure. If and when such a threshold level is determined present indications are that it will vary from type of asbestos fiber to type of asbestos fiber; from occupation to occupation; and from disease to disease.

3. What is the relationship between asbestosis and lung cancer?

There are reported cases of lung cancer victims showing symptoms of asbestosis, but if an individual does not smoke, asbestosis does not lead to lung cancer. The medical evidence is that asbestosis do occur irrespective of one's smoking habits while an excess risk of lung cancer has thus far been only associated with cigarette smokers.

4. What are the relative risks following exposure to only one variety of asbestos?

All commercial forms of asbestos cause asbestosis, bronchogenic cancer and mesothelioma. However, the risk is greatest with crocidolite, less with amosite and perhaps, still less with chrysotile.^(10b)

5. What is the mechanism of disease causation in asbestos-related diseases?

Existing evidence appear to indicate that extracellular processes and the physical features of fibers constitute a major part of the causation of the lung diseases associated with exposure to asbestos dust. The fiber diameter appear to be the controlling factor in the causation of disease.

The association of "asbestos-caused" cancer with cigarette smoking, coupled with the physical nature of the process of disease causation, as present studies indicate; perhaps, permits the speculation that asbestos fibers or other fibers of similar physical dimensions, once in the lungs act only as a mechanical confactor in enhancing retention, inhibiting clearance and modifying the distribution of inhaled insoluble cigarette smoke particles which are proven to be carcinogenic. It may be inferred, therefore, that other insoluble particulate matter of similar physical dimensions as asbestos may be equally cocarcinogenic as asbestos.

6. What other causes of mesothelioma are there?

There have been reported cases of mesothelioma that cannot be linked to asbestos but there are no known other causes of the disease other than exposure to asbestos dust.

7. Can asbestos cause other diseases?

Yes. There is ample evidence of an association between pleural plaques and all types of exposure to asbestos, and to all types of asbestos fiber. Asbestos is not the only cause of plaques but it is the most common. (33)

8. Is it possible to detect asbestosis early enough to permit a cure?

With regular x-ray examinations it is possible to detect the onset of asbestosis to at least permit its control. However, the latent period of asbestos-related diseases is estimated to be about 20 years. (18)

B. COMMENTARY

There is no doubt that the inhalation of substantial amounts of asbestos can lead to increased rates of various types of lung disease, including two forms of cancer. The medical literature is full of solid evidence linking asbestos to disease. Eliminating the emission of asbestos dust into the working environment appears to be an obvious way of dealing with the problem. This, however, may not be the most feasible approach in light of economic considerations. It then becomes necessary to examine what other alternatives exist.

There is strong evidence to indicate that all the diseases associated with asbestos is exacerbated by cigarette smoking. In fact, the evidence is that there is no excess risk of bronchogenic cancer in asbestos workers who do not smoke. In this case it appears that asbestos is merely a catalyst to the causation of bronchogenic cancer and the primary carcinogen is cigarette smoke.

An alternative solution to the problem that perhaps would be economically attractive to all concerned may thus be a requirement that workers in the asbestos industry be non-smokers. This option becomes even more attractive when recognition is taken of the fact that existing evidence, even though inconclusive at this time, indicates that other fibers with certain physical dimensions (below 3 μ m diameter) irrespective of chemical composition may have the same effect as asbestos.

In the self interest of Bendix the apparently physical nature of the mechanism of disease causation of asbestos fibers should be carefully considered in our search for alternate material for our brake lining composition.

P.S: SEE ATTACHMENT A FOR SUPPORTING DETAIL AND BIBLIOGRAPHY OF THE MEDICAL LITERATURE REVIEWED.