



DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
PUBLIC HEALTH SERVICE
CENTER FOR DISEASE CONTROL

PLAINTIFF'S EXHIBIT

SH-1895

NATIONAL INSTITUTE FOR OCCUPATIONAL
SAFETY AND HEALTH
3600 FISHERS LANE
ROCKVILLE, MARYLAND 20852

August 8, 1975

Dear Colleague:

This communication is intended to alert you to recently gathered information indicating a potential health hazard for persons exposed to asbestos during the servicing of motor vehicle brake and clutch assemblies.

On July 21, 1975, the National Institute for Occupational Safety and Health convened a meeting of government and university scientists, industry representatives, and labor union officials to discuss the present state of knowledge with respect to this problem. Data was presented by investigators from the Mount Sinai School of Medicine in New York City indicating that workers engaged in the maintenance and repair of automobile and truck brake linings are exposed to potentially hazardous levels of airborne asbestos dust. Specific brake servicing operations studied included blow-out of automobile drum brake assemblies, grinding of used truck brake linings, and bevelling of new truck brake linings. Average peak asbestos air concentrations for these three activities based on personal samples taken within ten feet of the operator were, respectively, 10.5, 3.75, and 37.3 fibers (>5 microns in length) per ml. An analysis of samples of brake drum dust revealed that almost all of the asbestos fibers found were shorter than 0.4 microns in length.

Previous studies of the extent of asbestos emissions from automobile brake lining wear showed that only a very small fraction of the original asbestos content of the brake lining is found in brake drum dust (Ref. 1-3). It was presumed that this is due to thermal degradation of the fibers during braking. The present findings indicate that enough asbestos is preserved to produce significant exposures during certain brake servicing procedures.

The full extent of asbestos-related disease in brake servicing personnel is not known at present because this particular occupational group has not been studied systematically up to now. However, a review of the scientific literature on the association between asbestos exposure and mesothelial tumors of the pleura and peritoneum has revealed at least four cases of these rare tumors in persons who were employed in jobs involving automobile brake servicing (Ref. 4-6).

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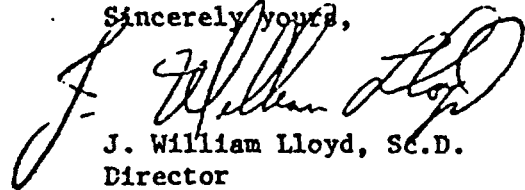
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For your information and guidance, we are enclosing pertinent references, estimates of the population at risk, a NIOSH interim recommendation for brake and clutch servicing procedures, and a copy of the Department of Labor standard covering exposure to asbestos in the work place.

The environmental studies of brake lining servicing operations outlined above together with observations of mesothelial tumors in persons so employed affirms the necessity for instituting and maintaining recommended control measures in this industry so that the health hazards of asbestos are minimized.

Sincerely yours,



J. William Lloyd, Sc.D.
Director
Office of Occupational Health
Surveillance and Biometrics

Enclosures

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REFERENCES

1. Lynch, J.R.: Brake Lining Decomposition Products. J Air Pollution Control Assoc, 18:824-26, 1968
2. Hickish, D.E. and Knight, K.L.: Exposure to Asbestos During Brake Maintenance. Ann Occup Hyg, 13:17-21, 1970
3. Jacko, M.G. and DuCharme, R.T.: Brake Emissions: Emission Measurements from Brake and Clutch Linings from Selected Sources. EPA Report 68-04-0020, 1973
4. Newhouse, M.L. and Thompson, H.: Mesothelioma of Pleura and Peritoneum Following Exposure to Asbestos in the London Area. Brit J Ind Med, 22:261-69, 1965
5. McDonald, A.D. et al.: Epidemiology of Primary Malignant Mesothelial Tumors in Canada. Cancer, 26:914-19, 1970
6. Greenberg, M. and Lloyd Davies, T.A.: Mesothelioma Register 1967-1968. Brit J Ind Med, 31:91-104, 1974

**ESTIMATES OF THE WORKFORCE POTENTIALLY EXPOSED TO ASBESTOS
IN THE MANUFACTURING AND SERVICING OF BRAKE LININGS AND CLUTCHES**

Auto Mechanics	833,535
Garage Workers	67,679
Manufacture (original and rebuilding)	<u>6,657</u>
TOTAL	907,871

SOURCE: Adapted from 1972 Census of Manufacturers, 1972 County Business Patterns, and Census of Population: 1970 Occupation by Industry (all are Department of Commerce, Census Bureau publications)

**RECOMMENDED (INTERIM) PROCEDURES FOR
ASBESTOS BRAKE AND CLUTCH SERVICING**

The National Institute for Occupational Safety and Health (NIOSH) has research underway concerning dust exposures during brake and clutch servicing. Due to preliminary data demonstrating significant asbestos exposures during presently used brake and clutch servicing techniques, NIOSH has reviewed alternate techniques whereby asbestos exposures are reduced. The following are interim procedures recommended by NIOSH to minimize dust exposures.

1. If possible, an area shall be designated for all brake and clutch repairs. Entrances into this area shall be posted with an asbestos exposure warning sign as follows:

Asbestos
Dust Hazard
Avoid Breathing Dust
Wear Assigned Protective Equipment
Do Not Remain in Area Unless Your Work Requires It
Breathing Asbestos Dust May Cause Asbestosis and Cancer

2. During brake servicing, an air purifying respirator, either single use or with replaceable particulate filter(s), as approved by the Mining Enforcement and Safety Administration (formerly Bureau of Mines) or NIOSH, shall be worn during all procedures starting with the removal of the wheels and including reassembly. During manual clutch servicing, such a respirator shall be worn during removal and cleaning of the clutch, pressure plate and housing assembly and during installation of the new clutch assembly.
3. Dust shall first be cleaned from brake drums, brake backing plates, brake assemblies and clutch assemblies using an industrial type vacuum cleaner equipped with a high efficiency filter system (>99% efficiency for 0.3 μ m diameter aerosols). After vacuum cleaning, any remaining dust shall be removed using a rag soaked in water and wrung until nearly dry. Under no circumstances shall compressed air or dry brushing be used for cleaning.
4. During arcing and riveting operations, an approved respirator, as described in (2) above, shall be worn. Grinding (arc) machines shall be provided with local exhaust ventilation such that worker exposures are maintained at least below the 1976 OSHA asbestos standard (29 CFR 1910.1001).* At a minimum, the dust bag of the arcing machine shall be removed and replaced with the hose of the high efficiency industrial vacuum described in (3) above.

5. Industrial vacuum cleaner bags containing asbestos dust and cloths used for wiping brake and clutch assemblies shall be sealed in plastic bags and labeled with the following warning label printed in letters of sufficient size and contrast to be readily visible and legible:

Caution
Contains Asbestos Fibers
Avoid Breathing Dust
Breathing Asbestos Dust May Cause Asbestosis and Cancer

All asbestos waste shall be disposed of in accordance with the OSHA asbestos regulation, 29 CFR 1910.1001(h). During removal of vacuum bags, an approved respirator, as described in (2) above, shall be worn.

6. All floor cleaning in areas where brakes and clutches are repaired shall be done with the high efficiency industrial vacuum cleaner as described in (3) above. Grinding (arcing) machines shall also be cleaned with such a vacuum cleaner and any remaining dust wiped with a damp cloth. An approved respirator, as described in (2) above, shall be used during this cleaning.
7. Although adherence to the above procedures should minimize any contamination of work clothing, it is required that the appropriate portions of the OSHA regulations on asbestos (29 CFR 1910.1001(d) (3 and 4)) concerning special clothing, change rooms, etc. be followed.

NOTE: Strict adherence to the above procedures should minimize exposures to mechanics during brake and clutch servicing. These are interim recommendations and are subject to revision pending results of ongoing NIOSH research.

- * Section 1910.1001 of the Code of Federal Regulations was formerly Section 1910.93a. This change was noted in the Federal Register, May 28, 1975.

Prepared By
Division of Field Studies and Clinical Investigations
National Institute for Occupational Safety and Health
Cincinnati, Ohio

DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE

CDC, NIOSH

Minutes of Occupational Exposures to Asbestos Dust From
Brake Linings Meeting

July 21, 1975

Attendees

See Attached

Proceedings

Dr. John F. Finklea, Director of NIOSH, welcomed the attendees. He stated that the purposes of the meeting were (1) to consider preliminary data on asbestos exposure among brake lining workers and (2) to discuss a future course of action based on this preliminary information. Dr. Finklea then turned the meeting over to Dr. Irving Selikoff of Mount Sinai for presentation of some of his work on this problem.

Dr. Selikoff described the background for our current concern. The health effects of asbestos are well known. However, the health hazard associated with asbestos in brake linings until recently has received little attention. It was thought that the intense heat generated from braking modified the asbestos and that brake lining dust contained insignificant amounts of asbestos fibers. Dr. Mancuso in 1963 did describe asbestos-related health effects in the manufacturing of asbestos for brake linings but apparently this caused little concern. In 1973, a case of mesothelioma was reported in a brake repair worker. This stimulated a re-examination of the problem. Dr. Selikoff consulted with Dr. Meyers of UAM, Dr. Cefalo of IAI and the Ford Motor Company and the group at Mt. Sinai initiated a study to determine if brake lining workers were exposed to significant levels of asbestos.

Dr. Selikoff introduced Dr. Langer of Mt. Sinai who reviewed the composition of brake linings and the breakdown products thought to occur from heat generated during braking. Previous studies did not demonstrate asbestos fibers in the amounts or prevalence as indicated by the current studies at Mt. Sinai. However, recent studies at Mt. Sinai demonstrated typical chrysotile asbestos fibers along with a wide range of other forms of crystalline and fibrous materials. He emphasized that the composition of brake linings may differ, for example, brake linings in the U.S. and Great Britain and products here in the U.S. may have undergone many changes over the years. This is particularly important since recent data show that 20% of the new car market is made up of these imports. Further research is needed to characterize the asbestos

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content of past and present dust exposures. It should be recognized also that the health effects of other materials in brake dust have not been studied.

Dr. Rohl from Mt. Sinai reported on studies of asbestos dust exposure in automobile repair shops in New York City. Peak exposures from 5-8 minutes duration were measured. Fiber counts, using the OSMA method, were from 6 to 30/ml at 3-5 feet from brake drums cleaned with compressed air. At 5-10 feet, counts ranged from 2 to 4 ml; at 10-20 feet 2.4 to 4.8/ml. Drums cleaned with a brush generated less airborne asbestos, 1.3-3.6 fibers/ml in the operators breathing zone. Eighty to 99% of the fibers as observed by electron microscopy were less than 1.4 microns in length, indicating a much higher exposure to asbestos fibers than indicated by optical microscopy. Workers engaged in grinding operations to renew brake linings were exposed to 2-7 optically visible fibers/ml. Those bevelling linings had high exposures ranging from 32-72 fibers/ml. Dr. George Wright pointed out that earlier studies showed that 1 to 3% of brake dust is fibrous asbestos.

Dr. Lorimer of Mt. Sinai reported on medical examination of 13 brake repair workers with 10-40 years of exposure. A substantial number were reported to have X-ray and ventilatory function abnormalities. Further studies need to be done in this area before any conclusions on health effects can be drawn. However, it was pointed out that at least four cases of mesothelioma have been reported nationally among automobile repair workers and this lends urgency to the problem.

Dr. Finklea asked for comments and recommendations for addressing the problem.

Mr. Meyers suggested that several practical control measures are feasible now. Indeed, these measures have been instituted in several shops. His union alerted its members via its newsletter and developed posters to alert workers to the problem. Mr. Meyers emphasized that the employers with whom he worked were most cooperative. Employers were encouraged to use vacuum cleaning of brake drums and, where necessary, masks to reduce exposure. His union has made arrangements for continued medical evaluation of its members. He emphasized the importance of union representatives having access to workplaces for observation of sanitary practices.

Dr. George Wright, an industrial consultant, emphasized that manufacturers have a responsibility to ascertain what happens to their products after being sold to others. This problem represents a difficult problem for the manufacturer and for their industrial customers. Dr. Wright stressed belief that the asbestos industry would cooperate in every possible way. Dr. Wright was not totally surprised by the fiber counts reported and expressed the belief that one might subsequently encounter the full spectrum of asbestos-related disease among priafers. Dr. Wright expressed concern that conditions might be worse and

exposures higher among some smaller businesses. Dr. Wright cautioned that the influence of fiber size should be considered and that any extrapolation to the general population be made with caution. He urged that any subsequent investigations utilize the UICC classification and the inclusion of negative controls. Dr. Wright cautioned against over-interpreting the occurrence of four mesothelioma cases.

Mr. Samuels of IUD urged that NIOSH:

- Notify the Department of Labor about this problem;
- Make minutes of this meeting available to public along with a suitable press release;
- Notify other involved unions;
- Institute an appropriate national sampling program;
- Institute a program of surveillance and intervention.

Other unions involved include:

- United Auto Workers
- Teamsters
- American Federation of Government Employees
- Allied Industrial Workers
- Laborers International
- International Association of Machinists
- American Postal Workers Union
- United Rubber Workers
- Amalgamated Transit Union
- Transport Workers Union of America
- United Transportation Union

Mr. Samuels of IUD urged that everyone be informed of existing, easily applicable control measures. Mr. Meyers suggested any release on control technology be built upon their asbestos safety bulletin.

Mr. Angelo Cefalo of IAI discussed the need to inform affected locals and union members in an orderly fashion. Mr. Cefalo stated that

the needed research program should be planned and funded. He offered his assistance in obtaining any needed support for this program.

Dr. Mancuso of the University of Pittsburgh at the request of the International Association of Machinists conducted a pilot study of death records and identified in 1973 a mesothelioma case (proven by autopsy) of a garage mechanic and another case of pleural mesothelioma in a millwright who was blowing out asbestos, friction-type clutches with compressed air at a paper company. Dr. Mancuso felt the nature of the death records was such that other cases of mesothelioma may exist but are unrecognized. He spoke of the need to use this opportunity to develop an effective industrial medical surveillance system.

Herb Northrop of Ford asked that any alert bulletin place this problem in perspective -- pointing out other recognized exposures to asbestos.

John Dement of DFSCI presented preliminary data from a NIOSH study showing peak exposures of up to 5 fibers/ml during brake drum blowing. He also showed peak lead levels of approximately 4.5 ng/ml during blowing operations. NIOSH electronmicroscopic studies of brake drum dust also showed a predominance of small asbestos fibers with most fibers being less than 1 micrometer in length. At a plant renewing lined brake shoes, exposures of 2) fibers/ml (during grinding) and peaks of up to 10 fibers/ml during emptying of a drum containing old linings were observed.

Dr. Weaver of API offered to communicate with gasoline stations and he supported further studies of the problem and emphasized the need to use appropriate controls of UICC film reading techniques.

Ed Alpaugh of International Harvester urged preparation of a joint release. Paul Toth of Ford offered to help with suggestions on control technology and in disseminating information from NIOSH on this matter to appropriate Ford Motor Company dealer relations personnel.

John Moran of EPA pointed out that disc brakes release more asbestos into the general environment than shoe brakes. He stated that the EPA expressway roadside study could look at asbestos levels along a gradient away from the expressway. Dr. Selikoff pointed out that braking, itself, may be important and that roadside studies should consider the effect of braking.

Dr. Mancuso was asked to comment on the needed health studies. He suggested an epidemiology study of the mortality experience of a cohort of unionized workers and their families. He emphasized need for extreme care in the experimental design. He thought such a study should look for other cancers and occupational respiratory diseases as well as asbestos-related disorders.

It was emphasized that workers were exposed to metals, plastic dusts (body shops), solvents and toxic gases like carbon monoxide. Dr. Mancuso recommended clinical studies in the same population of workers. He especially requested evaluation of so-called "nuisance dusts" which he claims may be more harmful than now realized. He emphasized need to look at workers who left the industry as well as those who are still employed.

Mr. Toth stressed the need to ascertain the role of tobacco smoking in any studies. Others agreed with him. Dr. Mancuso took exception to the undue emphasis on the smoking aspects, to the exclusion of proper recognition of the magnitude of inherent health risks due to the chemicals in dusts of the working environment.

Dr. Selikoff suggested seven areas for urgent study:

- Analysis of brake materials utilized since 1940 using literature survey and laboratory analysis (EPA/NIOSH).
- Broad based national industrial hygiene survey to assess exposures for various occupational tasks (NIOSH/OSHA).
- Epidemiologic studies of mortality experience of exposed workers from several sources (NIOSH). He suggests this receive the highest priority.
- Further clinical studies of 1,000 workers including suitable controls (NIOSH).
- Autopsy survey of lung asbestos burden of exposed workers in auto maintenance industry (NIOSH).
- Industrial hygiene measures to better control exposure (Joint effort of unions, industry and NIOSH).
- Education of workers to hazard and to use control measures (DOL/NIOSH).

Dr. Selikoff suggested that there be no delay in getting this program underway.

Dr. Joe Wagoner of NIOSH generally supported the discussed research program. He emphasized need for careful characterization of exposures to agents other than asbestos and the need to assure that limited research funds are used to answer some of our major remaining scientific questions about the effects of exposure to relatively low levels of short asbestos fibers. William Best of NCI offered his assistance and asked whether or not a case-control study might be of some help.