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UNION CARBIDE INTERNAL CORRESPONDENCE

UNION CARBIDE CORPORATION

PLAINTIFF'S EXHIBIT
UC-3035

To [Name]
Division
Location
Area

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Date

June 12, 1984

Originating Dept.

HS&EA

Ext.

P-2

Subject

Testimony: OSHA
Asbestos Rulemaking

On May 23, 1984 I submitted to OSHA a brief outline of the verbal comments I propose to make at the informal rulemaking hearing which commences on June 19, 1984. At the request of Ms. B. L. White, I have substantiated the bare bones by adding the beef!

My testimony is at present scheduled for July 12, 1984 and I should like to submit the attached document to supplement my previous submission.

Please review this material carefully and let me have comments and corrections by June 20, 1984. I propose to then send the final document to the Docket Office for incorporation in the record of the proceedings. Please call me (extension 5214) if you have any questions.

H. C. Lewinsohn

H. C. Lewinsohn, M.D.
Assistant Corporate Medical Director

HCL/sar

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ACL Doc 17879 · Page 1 of 41 asbestosclaims.law/library/17879/1

DRAFT

June 12, 1984

Docket Officer
Docket No. H-033C
Room S-6212
U.S. Department of Labor,
Third Street and Consititution Ave., N.W.
Washington, D.C. 20210

Re: Notice of Proposed Rulemaking (49FR 14116): Occupational Exposure to Asbestos

Dear Sir/Madam:

On Tuesday, April 10, 1984, OSHA published in the Federal Register a Notice of Proposed Rulemaking (NPR) on Occupational Exposure to Asbestos. The NPR requested data and comments on OSHA's proposed revisions to its Asbestos Standard 1910.1001. On May 23, 1984, I forwarded to Mr. Thomas P. Hall, a brief outline of the verbal comments I propose to make at the informal rulemaking hearing which commences on June 19, 1984. I have now prepared my formal presentation and submit it herewith, in quadruplicate, for inclusion in the record if this is still possible.

I hope that this additional document will prove useful and will be pleased to respond to any inquiries which is engenders.

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UCC 001587

MEDICAL EXAMINATIONS REQUIRED FOR ASBESTOS WORKERS

HILTON C. LEWINSOHN, MP BCh., MFOM., DIH., FCCP.
ASSISTANT CORPORATE MEDICAL DIRECTOR
UNION CARBIDE CORPORATION,
DANBURY, CONNECTICUT

Presentation to be made at the informal rulemaking hearing on the Proposed Rule on Occupational Exposure to Asbestos (29CFR, Parts 1910, Federal Register (1984) 49: 14116-14145) commencing on June 19, 1984.

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ABSTRACT:

The techniques which allow persons exposed to asbestos to be kept under surveillance will be briefly reviewed.

The pre-placement evaluation procedure and its usefulness is discussed.

The periodic medical evaluation is described and an outline of the essential requirements is given. The role of radiological surveillance is briefly discussed.

The point is made that both asbestos-exposed persons and their employers place reliance upon physicians to inform them of adverse findings so that decisions regarding alternative employment and future protection can be made in a sound and equitable manner.

Medical surveillance should ideally continue for the life-time of the individual once exposure has been documented, and post-retirement or post-severence health evaluation should be considered whenever practicable.

Asbestos-related diseases can be prevented by good work practices and engineering controls. The physician is able to intervene at the interface between worker and work and hopefully alter the final outcome to the good.

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ACL Doc 17879 · Page 4 of 41 asbestosclaims.law/library/17879/4

INTRODUCTION (Slide #1)

This dissertation on the medical surveillance of persons exposed to asbestos is in response to OSHA's request for comments in Section VI of the Proposal, namely: "Summary and Explanation of the Proposed Amendments and Other Issues Relevant to the Permanent Standard." Paragraph 11 (Medical Surveillance Program) on page 14126 discusses the proposed action level which will trigger the need for a medical surveillance program (a), and itemises a number of proposed policy decisions [(b) - (e)]. These proposals are discussed in this document although not necessarily in the same sequence as in the NPR.

Exposure to asbestos in various industries and occupations has been associated with three major lesions involving the intrathoracic organs.

Asbestosis, first recognized at the beginning of this century, is a form of interstitial pulmonary fibrosis which has been shown to be related to the dust levels in the workplace and to be dependent upon the duration of such exposure.

Lung cancer in heavily exposed workers in industries such as insulaton, construction, ship-building and asbestos textiles manufacture, has been adequately documented and related to asbestos exposure. Asbestos exposed persons who smoke cigarettes appear to have a 50 times greater chance of dying from lung cancer than non-smoking non-asbestos exposed persons.[1]

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ACL Doc 17879 · Page 5 of 41 asbestosclaims.law/library/17879/5

The third condition to be associated with exposure to asbestos is diffuse malignant mesothelioma of the pleura (or peritoneum).[2] Unlike asbestosis and lung cancer, this rare tumor has been more difficult to characterize in terms of dose-response and pathologic features.

Less clear-cut associations have been described by some observers between asbestos exposure and cancers involving the gastro-intestinal tract[3,4] and cancers in other organs such as the larynx[5] or renal organs.[6] Cancer of the ovary in women has been ascribed to asbestos exposure.[7] It is suggested that the cases described were actually of peritoneal origin and due to malignant mesothelioma of the peritoneum. It may be difficult to distinguish ovarian carcinoma from peritoneal mesothelioma.

Because of its increasing and widespread use in the U.S.A. in many industries during the past 50 years, lasting up until very recent times, it has been estimated that millions of people have been exposed in various ways to various varieties of asbestos.[9]

The asbestos-related diseases are not readily amendable to therapy. Asbestosis is slowly progressive, the outlook for the person with lung cancer is very poor and diffuse malignant mesothelioma of the pleura or peritoneum is invariably fatal within a short period of time after diagnosis. The physician practicing in the industrial environment is faced with a dilemma of severe proportions when attempting to intervene or prevent undue suffering on the part of exposed individuals, but with diligence and perserverence can definitely exert a meaningful influence.

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ACL Doc 17879 · Page 6 of 41 asbestosclaims.law/library/17879/6

Physicians whose practice includes providing a service to industry must be actively involved with workers and management, must be completely familiar with the properties of asbestos in use, must understand the manufacturing processes in the plant and have a clear concept of the plant design and

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ACL Doc 17879 · Page 7 of 41 asbestosclaims.law/library/17879/7

layout. The doctor who has taken the trouble to become educated in this way will be better equipped to manage the health of people at work. In addition to gaining practical experience of the workplace the physician also needs to gain a thorough working knowledge of the etiology, pathogenesis, epidemiology and therapy of work-related diseases. The physician should acquire a working knowledge and appreciation of the theory and practice of industrial hygiene, including an understanding of sampling and monitoring procedures. (Slide #2)

The role of the physician is to insure that industry employs people who are suited to the tasks required of them and that they do not suffer injury or illness as a result of the work they are called upon to do. (Slide #3)

PRE-PLACEMENT MEDICAL EVALUATION OF PERSONS EXPOSED TO ASBESTOS

The pre-placement medical evaluation is designed to determine the suitability of the employee for the job and the suitability of the particular job for the individual concerned. When asbestos exposure is likely, the workplace conditions must be known before decisions can be made about a prospective employee with medical contra-indications to such employment. As the result of experience already gained in the development of medical surveillance programs, the suitability of prospective employees for the specific tasks in question may be estimated and based upon defined selection criteria.[10] Applicants should be appropriately counseled regarding their fitness or otherwise for employment in an asbestos-exposed occupation and if any restrictions need to be imposed on medical grounds they should be indicated to the applicant and the employer prior to placement in the job. There are certain broadly defined conditions which should contraindicate

C2035

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ACL Doc 17879 · Page 8 of 41 asbestosclaims.law/library/17879/8

employment: a history of previous work in another industry with a recognized dust hazard such as coal mining or stone quarrying, an existing pulmonary disability due to pneumoconiosis or from any other source, the presence of obstructive airways disease with or without emphysema, asthma, and organic heart disease. (Slide #4) Other contraindications to employment in a dusty job which have been recommended are: (1) Nasal obstruction or deformity of such a degree as to make the wearing of a dust mask difficult or impossible, (2) gross physicial deformity of the chest such as scoliosis or kyphosis, or as a result of thoracic surgery, (3) chronic bronchitis, bronchiectasis or emphysema, (4) gross hypertension with cardiac impairment and (5) the presence of rheumatoid arthritis. (Slide #5)

Apart from identifying people who should not be employed in dusty work, the pre-placement evaluation serves the purpose of establishing base-line data for longitudinal prospetive follow-up. The data which should be incorporated in the medical records for this purpose are summarized in Tables 1 and 2.

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ACL Doc 17879 · Page 9 of 41 asbestosclaims.law/library/17879/9

Table 1

Identification characteristics required to establish a data base for long term follow-up of asbestos workers.

A. 1. Name (include maiden name for married women)
2. Identification number (social security number, etc.)
3. Date of Birth
4. Place of Birth
5. Address

B. 1. Name of spouse
2. Identification number of spouse (social security number, etc.)
3. Spouse's date of birth

C. 1. Names, dates of birth, addresses and identification number of children

D. 1. Employee's company I.D. number (clock no., etc.)*
2. Employee's occupation (job description, including raw materials handled)
3. Latest dust levels in job department

* The employee I.D. number should never change and should be reallocated to the same employee upon rehiring after termination of employment.

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ACL Doc 17879 · Page 10 of 41 asbestosclaims.law/library/17879/10

Table 2

Minimum requirements to be recorded to establish a data base for long term follow-up of asbestos workers.

Complete, detailed, occupational history since leaving school

Family history

Smoking history

Social history (drugs, alcohol, etc.)

Previous illnesses of note, especially respiratory ailments

Detailed respiratory symptoms history (MRC or ATS Respiratory Symptoms Questionnaire for modification thereof)

Vital and physical signs

Special investigations: 17" x 14" Postero-anterior chest roentgenogram*

Measurement of lung function (ventilatory capacity, lung volumes, gas transfer, etc.)

Sputum cytology (value not proven in screening)

Measurement of angle between nail and cuticle to document appearance of clubbing of fingers.

* Oblique views, and occassionally lateral views, may be required to clarify pleural abnormalities.

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ACL Doc 17879 · Page 11 of 41 asbestosclaims.law/library/17879/11

Table 2 (Continued)

The physician should take the opportunity which the pre-placement evaluation affords to counsel and advise the job applicant regarding the known facts about asbestos-related diseases. It is essential to emphasize the special risks the person will run if he or she smokes cigarettes and every effort should be made to discourage the habit. (Slide #6)

It has previously been pointed out that the pre-placement medical evaluation "is an essential tool for use in the medical supervision of asbestos workers because it establishes the principles upon which future management will be based. It gives the prospective applicant an insight into the seriousness of the problem and enables the physician to recommend suitability, limited suitability or total unsuitability of the individual for the job. The opportunity which the pre-placement physical examination provides for the medical staff to counsel the individual and establish rapport is unique and should not be missed. This period in the career of the job applicant provides the best opportunity for the recording of identification details and verifying them, in order to establish the data base for long-term follow-up."[12]

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ACL Doc 17879 · Page 12 of 41

asbestosclaims.law/library/17879/12

PERIODIC MEDICAL EVALUATION (SLIDE #7)

Persons exposed to asbestos in their occupation should be kept under medical surveillance. The object of periodic examinations is not only to determine changes in the physical condition, physiological status or radiological appearances of the exposed person but also to re-evaluate the workplace conditions and the individual's suitability to continue doing the same job. Medical findings can be recorded on an ongoing basis to allow comparison from one examination to the next. The periodicity of the evaluation process will depend upon demonstrated need and available man-power as well as regulatory requirements.

The Occupational Safety and Health Administration promulgated the Asbestos Standard (CFR 1910.1001) in July 1972.[11] Section 1001(j)(3) requires that every employer shall provide, or make available, at least annually, comprehensive medical examinations to each employee engaged in an occupation exposed to airborne concentrations of asbestos fibers. The minimum requirement is for "a chest roentgenogram (posterior-anterior 14 x 17 inches), a history to elicit symptomatology of respiratory disease, and pulmonary function tests to include forced vital capacity (FVC) and forced expiratory volume at 1 second ($FEV_{1.0}$)." (SLIDE #8)

Union Carbide trial exhibit UC-3035: H. C. Lewinsohn to T. A. Lincoln and Others Transmitting Draft OSHA Testim...
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ACL Doc 17879 · Page 13 of 41
asbestosclaims.law/library/17879/13

Periodic medical evaluation is designed to detect the biological effects of inhalation of asbestos as early as possible and hopefully at a stage when removal from further occupational exposure to asbestos may arrest or significantly delay the progress of asbestosis or the occurrence of other asbestos-related conditions. Epidemiologic evidence of the value of this procedure is not yet available and the changing environmental conditions in the workplace throughout the asbestos industry over the past fifty years only serves to confuse the issue when attempting to assess the value of early diagnosis.[13]

The periodic evaluation should include a physical examination even though the present OSHA standard does not specify it. The examiner should concentrate on the physical signs associated with pulmonary fibrosis such as bilateral end-inspiratory fine crackles at the lung bases, finger-clubbing and breathlessness. In the case of long-service employees, especially heavy-smokers, the possibility of lung cancer should always be borne in mind. Transient pleural effusions occur in asbestos workers.

The aim of radiologic surveillance of asbestos workers is to compare serial roentgenograms taken throughout the exposure period at regular intervals in order to detect the earliest changes. Radiographic evidence of predominantly basal diffuse interstitial fibrosis is the characteristic change seen in asbestosis. The Medical Advisory Panel (MAP) of the Asbestos International Association has prepared a document entitled "Criteria for the Diagnosis of Asbestosis and Considerations in the Attribution of Lung Cancer and Mesothelioma to Asbestos Exposure".[14] The MAP recommend that to ensure

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ACL Doc 17879 · Page 14 of 41 asbestosclaims.law/library/17879/14

comparibility of radiographs they must be of good technical quality, of full size (14"x17") and both costo-phrenic angles should be visible. Ideally inspiration should be such as to have brought the diaphragm below the fifth rib anteriorly and the tenth rib posteriorly. The recording of changes on the radiograph should be in accordance with the ILO International Classification of Radiographs of Pneumoconioses (1980).[15]

Pleural lesions are often the first radiological indicator of exposure to asbestos. These changes may consist of diffuse or localized pleural thickening. Circumscribed pleural plaques, with or without calcification, may occur and may not be associated with obvious parenchymal fibrosis. The pleural abnormalities can be sufficiently extensive to obscure the lung fields and may, in rare cases, lead to impairment of lung function.

Pleural plaques develop in the parietal pleura, seldom cause disability, and are not considered to be a compensable condition in certain countries, eg. Britain. Pleural effusions may be transient but some are chronic and may recur.

Diffuse pleural thickening associated with exposure to asbestos has become increasingly recognized. Both pleural layers are affected and restrict the expansion of the lung. The diagnosis depends on the exclusion of other causes such as tuberculosis and other infections, collagen diseases, trauma, chronic uraemia, and drug induced fibrosis.

It has been shown that whereas parenchymal radiographic patterns change in relationship to dust concentrations experienced over the course of time,

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ACL Doc 17879 · Page 15 of 41 asbestosclaims.law/library/17879/15

pleural changes are related to length of exposure, irrespective of dose. Pleural changes probably represent an important radiologic sign which is part of a constellation of changes observed in low-grade exposure groups where parenchymal effects are less likely to be seen.[16] (SLIDE #9)

Weill[17] has attempted to evaluate the basis for clinical decision making by the physician evaluating patients who have had occupational exposure to asbestos. In an asbestos worker definite radiographic evidence of diffuse pulmonary fibrosis, even if it is minimal in profusion or extent, should be an indication to advise the individual that further exposure to asbestos dust may increase the probability that the condition will progress with time. The greater the past cumulative dust exposure, the higher the probability of progressive pulmonary fibrosis according to Weill. Cessation of exposure is only likely to minimize the degree of progression of fibrosis and, because the excess risk for development of respiratory cancer has been shown to be dose-related, this should also be minimized by not adding further to the dust dose of individuals with radiographic signs of asbestosis. (SLIDE #10)

Pleural thickening and pleural plaques are apparently related to length of exposure and time since first exposure but not to dose, and are not therefore liekly to be influenced by modest additional exposure. Weill believes that when only pleural stigmata of asbestos exposure are present, continued medical surveillance and periodic evaluation is indicated but job transfer is not necessary. The individual should be told about the pleural lesions which have been noted so that the subsequent election to change to a job without further asbestos exposure can be considered if so desired.

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ACL Doc 17879 · Page 16 of 41 asbestosclaims.law/library/17879/16

In the past 5 or 6 years the use of computed tomography (CT) in the diagnosis of asbestos effects on lungs and pleura has shown that both types of lesion are seen more obviously than on conventional radiographs. This diagnostic technique is not yet a practical tool to add to the medical surveillance armamentarium but it is useful in early diagnosis. Early pleural plaques can be reliably diagnosed and are not confused with "companion" shadows adjacent to the ribs as in chest radiographs. Fine interstitial parenchymal disease can also be detected on CT when not visible on the chest radiograph according to Kreel.[18] By the time the changes of asbestosis have become visible on the chest radiograph, the changes on CT scan appear gross. The same author states that in one third of cases with unilateral pleural effusion there will be evidence on CT of pleural plaques particularly in the contralateral hemithorax. CT scans may thus be very useful in the diagnosis of mesothelioma and Kreel postulates that the finding of pleural effusion, rib destruction, pleura plaques or calcifications, intrapulmonary nodules and thickening of pleural, pleural fissures and paramediastinal structures especially at the bases and posteriorly should suggest this lesion. He also feels that the delineation of tumor nodules within effusions allows this tumor to be analyzed sequentially and better evaluated following treatment thus leading to improved therapeutic modalities. (SLIDE #11)

In the periodic evaluation of asbestos exposed persons it is recommended that tests of lung function be used to determine the earliest effects possibly resulting from exposure. The measurement of the timed vital capacity components, namely, forced vital capacity (FVC), forced expiratory volume in the first second of expiration ($FEV_{1.0}$) and the ratio of these

Union Carbide trial exhibit UC-3035: H. C. Lewinsohn to T. A. Lincoln and Others Transmitting Draft OSHA Testim... Published by AsbestosClaims.Law
ACL Doc 17879 · Page 17 of 41 asbestosclaims.law/library/17879/17

($FEV_{1.0}$/FVC), should be routinely recorded. A restrictive pattern is consistent with the development of pulmonary fibrosis (asbestosis) but other causes should first be ruled out. A predominantly obstructive pattern is uncommon in the absence of a smoking history. A comparison of periodic lung function test results over a number of years is of much greater value in the follow-up of an individual than a single observation where comparisons can only be made with the "predicted normal value". Where facilities exist for more complete studies they should at least include measurement of lung volumes and the single-breath carbon monoxide diffusing capacity.

No mention has been made thus far of the role of sputum examination for exfoliative cytology. A proposal has been made in the United States that this should be performed routinely on persons with 10 or more years of exposure to airborne concentrations of asbestos fibers or who are 45 years of age or older.[19] A large-scale multi-institutional program designed to evaluate periodic screening for early stage bronchogenic carcinoma among asymptomatic asbestos workers is currently in progress.[20] Interim results do not indicate that sputum cytology is of overall benefit to screened individuals and "early data from studies of smoking men at high risk of lung cancer indicate that only one fourth of asymptomatic lung cancers are detected by sputum cytology and the remainder are detected by chest radiography.[21]

The value of the periodic medical evaluation depends upon the manner and thoroughness with which it is performed. The standardization of the protocol will enhance its early diagnostic capabilities.

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ACL Doc 17879 · Page 18 of 41 asbestosclaims.law/library/17879/18

The strictest attention must be paid to the detail of radiologic and physiologic methods employed. It should always be borne in mind that the employee's attitude to periodic evaluation is different from that to pre-employment evaluation and whereas the concerns at the time of the latter are job suitability, the concerns in the employee's mind at the time of the former are job retention.

LIFE-LONG SURVEILLANCE

Persons who are exposed to asbestos should not only be kept under surveillance while exposed, but because of the lapsed interval between first exposure and the detection of biological effects, they should continue to be medically evaluated at periodic intervals for the rest of their lives. To expect employers to provide for this would be onerous and costly, but the need should be emphasized at the time of the employee's termination health review.

Retirees who receive pensions from employers may conceivably be easier to follow-up than persons who sever employment prior to reaching retirement age. Employers should endeavor to impress upon such employees the value of remaining under medical surveillance. The follow-up of retirees could be undertaken by means of a health questionnaire sent by mail incorporating a reminder to each one to see a physician and have a chest radiograph taken. It is a possibility that in some cases this could lead to the early detection of lung cancer and institution of therapy which may prolong life and alleviate suffering.

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ACL Doc 17879 · Page 19 of 41 **asbestosclaims.law/library/17879/19**

CONTENT OF A MEDICAL SURVEILLANCE PROGRAM

Table 3 illustrates the complexity of designing an adequate medical surveillance program which satisfies the needs described in the preceding pages of this document. The following section is based upon recommendations from Organization Resources Counselors, Inc. (ORC) which were submitted to the Assistant Secretary of Labor for Occupational Safety and Health on June 6, 1983. (A copy of the relevant portion of this submission is attached hereto as Appendix 1).

The approach adopted is that certain procedures should be obligatory upon the employer to incorporate in the mecial surveillance of persons exposed to asbestos at or above the action level. These obligatory procedures for pre-employment or pre-assignment examinations, periodic examinations and termination examinations are the obtaining of a medical history which includes a respiratory symptoms questionnaire, physical examination of the respiratory system and digestive system, chest radiology and pulmonary function tests.

Insufficient positive evidence exists for the obligatory incorporation of sputum cytology in the medical surviellance program. In the NPR the question is asked as to whether it would be appropriate to screen asbestos exposed persons for colo-rectal cancer, including tests for occult blood in the feces. Colo-rectal screening by means of occult blood tests is a routine procedure already incorporated into many employer's medical programs and is required in the surveillance of acrylonitrile exposed persons over age 40

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ACL Doc 17879 · Page 20 of 41 asbestosclaims.law/library/17879/20

Union Carbide trial exhibit UC-3035: H. C. Lewinsohn to T. A. Lincoln and Others Transmitting Draft OSHA Testim...
ACL Doc 17879 · Page 21 of 41

TABLE 3

MEDICAL SURVEILLANCE OF PERSONS EXPOSED TO ASBESTOS: PERIODICITY OF MANDATORY PROCEDURES

TYPE OF PROCEDURE	PRE-EMPLOYMENT OR PRE-ASSIGNMENT	PERIODIC						TERMINATION	POST-EMPLOYMENT	
		AGE			EXPOSURE				RETIREES	OTHERS
		35	35-45	45	5	5-10	10		BY MAIL ONLY	
Medical History (Respiratory Symptoms Questionnaire See Ap. B1 & B2)	Obligatory	ANNUAL	ANNUAL	ANNUAL	ANNUAL	ANNUAL	ANNUAL	Obligatory as in Preplacement Examination	Annual 1) Reminder to continue with medical checks. 2) Questionnaire	Advisory Letter at Termination - Continue Medical Checks
Physical Examination	Obligatory To include examination of Respiratory System and Digestive System	Every 5 Years	Every 2 Years	ANNUAL	Every 5 Years	Every 2 Years	ANNUAL	Obligatory as in Preplacement Examination	Voluntary By Own Physician	"
Chest Radiology (PA view 14" x 17") See Appendices C1 & C2)	Obligatory (Not required if recent film available, i.e., within preceding 12 months)	Every 5 Years	Every 2 Years	ANNUAL	Every 5 Years	Every 2 Years	ANNUAL	Obligatory as in Preplacement Examination	Voluntary By Own Physician	"
Pulmonary Function (FEV_1, FVC, FEV_1/FVC %) See App. D1 & D2	Obligatory	Every 5 Years	Every 2 Years	ANNUAL	Every 5 Years	Every 2 Years	ANNUAL	Obligatory as in Preplacement Examination	Voluntary By Own Physician	"
Other e.g., Sputum Cytology	Voluntary	N/A	N/A	ANNUAL	N/A	N/A	ANNUAL	Voluntary	Voluntary	"

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years. It is reasonable to add this test in the surveillance of asbestos workers with more than 20 years exposure, although recent reports reviewing the excess incidence of GI cancers in asbestos workers have found this to be a weaking association in the epidemiologic sense of the word.[22]

Before discussing the periodicity of specific surveillance techniques it is appropriate to discuss the question of post-employment follow-up. In Table 3 it is suggested that this may be achieved by a mailing of a health questionnaire to retirees and a recommendation to them to voluntarily see their own physicians. Other terminated former exposed asbestos workers should receive advice at termination to continue with medical checks by their own physician. These items are of a volunary nature and are of unproven worth at the present time. However, a need exists to improve the information on morbidity and mortality presently available in order to facilitate the future control of asbestos exposure and to verify present standards and these suggestions are made in the hope that they can be adopted by employers and employees on a voluntary basis without incrimination for failure to do so because of administrative or other valid business reasons.

The periodicity of the various components of the surveillance program has been empirically determined based on current thoughts and understanding of the subject within the international medical community. The following Tables 4-10 summarize the data in Table 3 according to the type of examination, its content and periodicity. (SLIDES #12 - 18)

Union Carbide trial exhibit UC-3035: H. C. Lewinsohn to T. A. Lincoln and Others Transmitting Draft OSHA Testim... Published by AsbestosClaims.Law
ACL Doc 17879 · Page 22 of 41 asbestosclaims.law/library/17879/22

On page 14131-2 comments on issues pertaining to medical examinations in the construction industry including those listed in the general industry discussion are solicited. In the preceding discussion the logistic difficulties involved in developing an adequate medical surveillance program are discussed and it is suggested that attention should be directed toward developing a generic standard for physical examinations and the identification and documentation of hazardous materials, processes, and work practices in the industry. OSHA's goals are admirable but probably unachievable at the present time. By its own admission OSHA has insufficient "information regarding the variety of exposures to construction employees" since it requests more in the proposal. Construction workers, as described on page 14128, work across the board in many industries and the occurrence of asbestos-related diseases has been described in many of the occupations listed. If one of the main objectives of medical surveillance is early detection of health effects then it would appear that this potentially large group of workers may be excluded from this benefit. Another valuable use of the data collected in the course of medical surveillance programs is for retrospective/propsective epidemiological studies. Such studies are needed if reasonable standards are to be set and met.

I suggest that OSHA could make use of its Regional Offices to establish Regional Medical Surveillance Centers for asbestos workers as well as persons exposed to other potential health stresses in industry, referred at the request of the employer, trade union, private physician or even self-referred. A reasonable fee could be charged for pre-employment (pre-placement and periodic examinations. Such Centers could also provide a

Union Carbide trial exhibit UC-3035: H. C. Lewinsohn to T. A. Lincoln and Others Transmitting Draft OSHA Testim... Published by AsbestosClaims.Law
ACL Doc 17879 · Page 23 of 41 asbestosclaims.law/library/17879/23

service to retired or terminated workers in need of long-term follow-up. Persons using the Centers would be issued with an appropriate card or certificate indicating any work restrictions which the examining physician recommends. Persons seeking work in the "construction industry" would have to be in possession of a current medical surveillance card. The periodicity of examinations required could be based upon Table 3 in this document. This suggestion represents my personal views and the opinion expressed on this issue are my own and do not reflect those of my employer or any other persons or organizations of which I am a member.

COMMENTS

The prevention of asbestos-related diseases depends upon engineering technology and dust control. The role of the physician is the prevention of ill-suited job-placement and intervention at the interface between worker and work. The technique of medical surveillance is merely one cog in the wheel which comprises the total effort required to safeguard employee health. The active collaboration of employer and employee in the surveillance program allows it to achieve significant results of benefit to both.

Union Carbide trial exhibit UC-3035: H. C. Lewinsohn to T. A. Lincoln and Others Transmitting Draft OSHA Testim...
ACL Doc 17879 · Page 24 of 41
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asbestosclaims.law/library/17879/24

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ACL Doc 17879 · Page 25 of 41
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SLIDE #1

THREE MAJOR DISEASES ASSOCIATED WITH ASBESTOS EXPOSURE:

A S B E S T O S I S

L U N G C A N C E R

M A L I G N A N T M E S O T H E L I O M A

- PLEURA

- PERITONEUM

LESS CLEAR-CUT CONDITIONS ASSOCIATED WITH ASBESTOS:

G I SYSTEM CANCERS

LARYNGEAL CARCINOMA

RENAL CARCINOMA

NON-HODGKINS GASTROINTESTINAL LYMPHOMA

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SLIDE #2

PHYSICIANS MUST BE ACTIVELY INVOLVED WITH WORKERS AND MANAGEMENT,

MUST BE COMPLETELY FAMILIAR WITH THE PROPERTIES OF ASBESTOS IN USE,

MUST UNDERSTND THE MANUFACTURING PROCESS IN THE PLANT

MUST HAVE A CLEAR CONCEPT OF THE PLANT DESIGN AND LAYOUT,

MUST HAVE A THOROUGH WORKING KNOWLEDGE OF THE ETIOLOGY, PATHOGENESIS, EPIDEMIOLOGY AND THERAPY OF WORK-RELATED DISEASES, AND

MUST ACQUIRE A WORKING KNOWLEDGE AND APPRECIATION OF THE THEORY AND PRACTICE OF INDUSTRIAL HYGIENE, INCLUDING UNDERSTANDING OF SAMPLING AND MONITORING PROCEDURES.

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SLIDE #3

THE ROLE OF THE PHYSICIAN IS TO INSURE THAT THE

INDUSTRY EMPLOYS PEOPLE WHO ARE SUITED TO THE TASKS

REQUIRED OF THEM AND THAT THEY DO NOT SUFFER INJURY

OR ILLNESS AS A RESULT OF THE WORK THEY ARE CALLED

UPON TO DO.

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SLIDE #4

PRE-PLACEMENT EVALUATION:

CONTRA-INDICATIONS TO EMPLOYMENT IN ASBESTOS AREAS:

1. HISTORY OF PREVIOUS DUST EXPOSURE, EG. COAL MINES

2. EXISTING PULMONARY DISABILITY DUE TO PNEUMOCONIOSIS OR FROM ANY OTHER CAUSE

3. PRESENCE OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE, WITH OR WITHOUT EMPHYSEMA

4. ASTHMA

5. ORGANIC HEART DISEASE

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ACL Doc 17879 · Page 31 of 41
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SLIDE #5

OTHER CONTRA-INDICATIONS SUGGESTED ARE:

1. NASAL OBSTRUCTION OR DEFORMITY OF SUCH SEVERITY AS TO MAKE THE WEARING OF A RESPIRATOR IMPOSSIBLE,

2. GROSS PHYSICIAL DEFORMITY OF THE CHEST WHICH IMPAIRS LUNG FUNCTION,

3. CHRONIC BRONCHITIS, BRONCHIECTASIS OR EMPHYSEMA,

4. GROSS HYPERTENSION WITH CARDIAC IMPAIRMENT,

5. RHEUMATOID ARTHRITIS.

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SLIDE #6

THE PHYSICIAN SHOULD TAKE THE OPPORTUNITY WHICH THE

PRE-PLACEMENT EVALUATION AFFORDS TO COUNSEL AND ADVISE

THE JOB APPLICANT REGARDING THE KNOWN FACTS ABOUT

ASBESTOS-RELATED DISEASES.

IT IS ESSENTIAL TO EMPHASIZE THE SPECIAL RISKS THE

PERSON WILL RUN IF HE OR SHE SMOKES CIGARETTES AND

EVERY EFFORT SHOULD BE MADE TO DISCOURAGE THE HABIT.

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SLIDE #7

PERIODIC MEDICAL EVALUATION

OBJECTIVE: KEEP EXPOSED WORKERS UNDER OBSERVATION TO

DETERMINE

- CHANGES IN PHYSICAL STATUS

- CHANGES IN PHYSIOLOGICAL STATUS

- CHANGES IN CHEST X-RAYS

THE WORKPLACE SHOULD BE RE-EVALUATED WITH THE SAME CARE AND FREQUENCY BY THE PHYSICIAN TO ENABLE A DECISION TO BE MADE WITH REGARD TO THE EMPLOYEE'S SUITABILITY TO CONTINUE DOING THE SAME JOB.

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SLIDE #9

PLEURAL PLAQUES.

PLEURAL CHANGES RELATED TO LENGTH OF EXPOSURE IRRESPECTIVE OF DOSE.

PROBABLY AN IMPORTANT RADIOLOGIC SIGN FOUND IN LOW GRADE EXPOSURE GROUPS WHERE PARENCHYMAL EFECTS ARE LESS LIKELY TO BE SEEN.

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SLIDE #11

INDICATIONS FOR COMPUTER TOMOGRAPHY OF THE THORAX.

EARLY PLEURAL PLAQUES CAN BE MORE RELIABLY DIAGNOSED;

PLEURAL PLAQUES AND THICKENING CAN BE DISTINGUISHED

FROM "COMPANION" SHADOWS ADJACENT TO RIBS;

FINE INTERSTITIAL PARENCHYMAL DISEASE CAN BE DETECTED

WHEN NOT VISIBLE ON CHEST RADIOGRAPHS;

USEFUL IN THE DIAGNOSIS OF MESOTHELIOMA.

(THE FINDING OF PLEURAL EFFUSION,

RIB DESTRUCTION,

PLEURAL PLAQUES OR CALCIFICATIONS,

INTRAPULMONARY NUDULES AND THICKENING

OF PLEURA, PLURAL FISSURES ANDand PARAMEDIASTINAL

STRUCTURES, ESPECIALLY AT THE BASES AND

POSTERIORLY,

SHOULD SUGGEST THE PRESENCE OF MESOTHELIOMA).

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SLIDE #13

TABLE 5

MEDICAL SURVEILLANCE OF PERSONS EXPOSED TO ASBESTOS:

PERIODIC EVALUATION : 35 YEARS OF AGE OR 5 YEARS EXPOSURE

- MEDICAL HISTORY - RESPIRATORY SYMPTOMS QUESTIONNAIRE: ANNUALLY
- CHEST X-RAY - (PA VIEW 14" x 17")
- PHYSICAL EXAMINATION — EVERY 5 YEARS
- PULMONARY FUNCTION TESTS (FEV_1, FVC, FEV_1/FVC%)
- SPUTUM CYTOLOGY - NOT INDICATED

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ACL Doc 17879 · Page 37 of 41
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SLIDE #14

TABLE 6

MEDICAL SURVEILLANCE OF PERSONS EXPOSED TO ASBESTOS:

PERIODIC EVALUATION : AGES 35-45 YEARS OR 5-10 YEARS EXPOSURE

- MEDICAL HISTORY - RESPIRATORY SYMPTOMS QUESTIONNAIRE: ANNUALLY
- PHYSICAL EXAMINATION
- CHEST X-RAY - (PA VIEW 14" x 17") EVERY 2 YEARS
- PULMONARY FUNCTION TESTS (FEV_1, FVC, $FEV_1/FVC\%$)
- SPUTUM CYTOLOGY - IF INDICATED BY SMOKING HISTORY OR OVER AGE 40 YEARS

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SLIDE #16

TABLE 8

MEDICAL SURVEILLANCE OF PERSONS EXPOSED TO ASBESTOS:

PERIODIC EVALUATION : TERMINATION

MEDICAL HISTORY

PHYSICAL EXAMINATION

CHEST X-RAY

PULMONARY FUNCTION TEST

SPUTUM CYTOLOGY

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ACL Doc 17879 · Page 39 of 41
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SLIDE #17

TABLE 9

MEDICAL SURVEILLANCE OF PERSONS EXPOSED TO ASBESTOS:

PERIODIC EVALUATION : RETIREES

- BY MAIL ONLY
- REMINDER: HAVE REGULAR MEDICAL CHECKS
- HEALTH STATUS QUESTIONNAIRE - COMPLETE AND RETURN
- RELY UPON PERSONAL PHYSICIAN

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SLIDE #18

TABLE 10

MEDICAL SURVEILLANCE OF PERSONS EXPOSED TO ASBESTOS:

PERIODIC EVALUATION : POST-EMPLOYMENT - OTHER THAN RETIREES

- ADVISORY LETTER AT TERMINATION: "CONTINUE MEDICAL CHECKS"
- CONSULT PERSONAL PHYSICIAN TO ARRANGE PERIODIC FOLLOW-UP

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