


PROGRAM

MEDICAL SEMINAR - 1974

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TX TINER
RMC0036008

# PULMONARY FUNCTION STUDIES

In many of our plants, we have dusty working conditions which while not necessarily causing any pulmonary disease require that our employees be monitored in the Medical Department. This is particularly true in our mining operations, alumina plants, reduction plants, and in the areas of our cast houses in our fabricating plants. In addition, we have an environment with solvents and oil mists present in the work place which also are classified as nuisance dusts but which require human monitoring. These people need periodic surveillance in the Medical Department.

The best pulmonary studies and the most meaningful are first a pulmonary history, second a chest x-ray, and third pulmonary function studies. We have found that employees who have allergies or asthma or special sensitivity to certain substances do poorly in these environments and careful pre-placement screening of these people should be done before they are hired to avoid placing them in an environment that will aggravate their condition. We need to have a questionnaire filled out by our employees who are to be monitored concerning asthma, hay fever, smoking habits, previous occupational dust exposure, hobbies, and any other condition that might contribute to changes in lung function. In addition, questions should be asked about chronic cough, sputum production and character of it, and physical symptoms; e.g., shortness of breath, chest pain, etc., that the employee might be experiencing. I have attached a sample questionnaire which you may want to use.

In evaluating pulmonary function, we want to know

(1) whether the individual has normal lung capacity and elasticity
(2) whether he has stiff lungs due to fibrosis or scarring which have lost their elasticity, or
(3) whether they have obstructive pulmonary disease where the inflow and outflow of air is compromised by narrowing of the bronchial tubes.

The pulmonary test with the spirometer tells you this information.

The forced vital capacity expressed in liters is the basic test of lung volume. It is based on the patient's height and age. We have upon advice of several pulmonary physiologists adopted the V. A. Kory scale and normally this should be 80% or above as estimated from the figures obtained from the enclosed tables. The 1 second f.e.v. is the best test for obstructive lung disease and is calculated from the table enclosed. As far as Reynolds Metals Company is concerned, the normal figure is 75% or above. As age increases, these figures of course change and the following table gives the range for the f.e.v. 1 second by age.

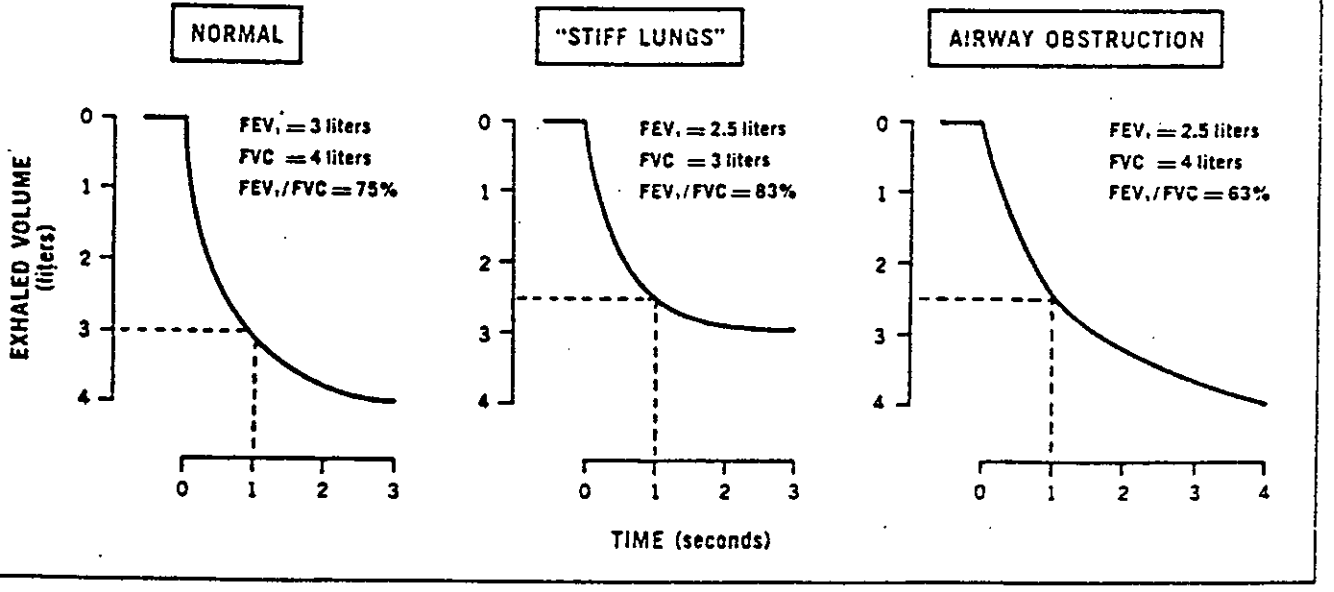
FORCED EXPIRATORY VOLUME
1 SECOND - NORMAL VALUES

| Age Grouping | F.E.V. 1-second |
|---|---|
| Under 40 | 80% - 85% |
| 40 - 55 | 75% - 85% |
| Over 55 | 70% - 85% |

Normally, one loses approximately 20 - 25cc's volume in the lungs each year. This is a normal occurring feature and does not designate disease.

Individuals with obstructive lung disease which is progressive may lose as much as 50 - 75cc's per year, and this gradually catches up with them causing chronic pulmonary invalidism. The figures below give a graphic indication of these three types of pulmonary response.

Figure 2



We feel that the monitoring of individuals for pulmonary disease is a service that the nurse can perform. We certainly need a base line of pulmonary function upon pre-placement examination. Those workers who have an exposure to dust, oil mist, asbestos or other toxic lung substances should have periodic pulmonary function studies done to spot early pulmonary disease. We feel that these tests should be done at least once a year where the employee works in these possibly hazardous areas. If they have a deterioriation of the pulmonary function as evidence by repeated pulmonary tests, something positive must be done to protect them or get them out of their environment.

Enclosed also is a pulmonary disease screening questionnaire which has been used on national pulmonary health surveys and certainly would be applicable to our particular activities. This does not need to be filled out on the pre-placement examination but should be filled out on the health screening survey of our workers and it is best filled out by direct questioning by the nurse or technician doing the pulmonary testing.

We feel that the Pulmonar is probably the best instrument to use and that the two tests we have spoken of, namely the vital capacity and the f.e.v. 1 second, are all that are needed. More sophisticated calculations, we feel, should be left to the pulmonary physiologists on those cases that show gross lung pathology.

Chest x-rays once a year on these people should be done and should be read and reported by the physician or the x-ray consultant if need be.

Enclosed also is a suggested form which can become his personal medical history on which the periodic pulmonary function studies can be recorded. We will have these forms made up for distribution if you feel they are satisfactory.

# PERSONAL PULMONARY FUNCTION RECORD

| DATE | CORRECTED VITAL CAPACITY | | F.E.V. 1-SECOND | | PERSONAL PROTECTION USED? WHAT TYPE? |
|---|---|---|---|---|---|
| | cc's | % | cc's | % | |
| | | | | | |

TX TINER
RMC0036012

## PERIODIC HEALTH EXAMINATIONS - MULTI-PHASIC SCREENING

In almost all of our plants now, we have Federal regulations that require that we monitor the health of our employees who might have been exposed to even minute quantities of various toxic substances. The levels at which monitoring has to be done allow a tremendous factor of safety but we will have Federal compliance officers reviewing our collected data to be sure that we conform to the Federal regulations.

We may have a few areas where we are affecting the health of our workers and we certainly want to do whatever physical and biological monitoring is needed to insure that toxic exposures are eliminated. In talking with our medical staff, and with some of you individually, I have come to the conclusion that we do need now to be doing annual health appraisals on all of our employees in the plants and along with this, we should collect whatever data is required for the Federal government.

We have had some successful programs at some of our locations, particularly our larger ones where we have an annual or every other year program of examining our employees. Much of this data collecting is done by our nurses. At the nurses' meeting in Richmond this past spring, we went over in detail a multi-phasic screening program which we recommended that they get your help on in initiating and augmenting. Such a program we felt should include

(1) a brief health questionnaire reviewed by the nurse and commented on where an abnormal history is obtained
(2) auditory and visual testing
(3) a measurement of height and weight
(4) blood pressure
(5) pulmonary function
(6) chest x-ray
(7) hemoglobin and urinalysis
(8) EKG over 40 or if indicated from the history
(9) possibly an SMA-12

In our reduction plants, it would also include a pre-shift urinalysis for fluorides or any other biological monitoring that is required by OSHA. The results of these tests then can be reviewed by the doctor with whatever specific examinations he may want to do depending upon the history. The patient should be advised of the results of these examinations and urged to see his doctor with these results if they are abnormal. Of course, we would need to keep records of these examinations plus individual records of monitoring procedures as required.

It makes more sense to me to combine all of these into one examination rather than to have the individual back three or four times for special OSHA required tests which would be of no real benefit to him but merely record keeping. I have enclosed in your syllabus a questionnaire that was developed some years ago for the monitoring program at Sherwin and San Patricio. Feel free to use it or modify it in any way you see fit.

# SUGGESTED FORBIDDEN LIST FOR PLANT PURCHASING STAFF

The following is a suggested list of chemicals which should not be contained in materials purchased by Reynolds Metals Company facilities without approval, in writing, of the Corporate Medical Department:

Asbestos
Acrylamide
Aniline
Arsenic
Benzene
Beryllium (except master alloy)
Cadmium (silver solder, etc.)
Carbon Disulfide
Carbon Tetrachloride
Cyanide
Dinitrobenzene
Dinitro-o-Cresol
Dinitrotoluene
Methyl Butyl Ketone (MBK)
Tetrachloroethane
Toluene Diisocyanate
Triorthocresyl Phosphate
Vinyl Chloride

This list does not include all possible serious industrial poisons, but only those most likely to be encountered. The list of 14 carcinogens recently banned is as follows:

2-Acetylaminofluorene
4-Aminodiphenyl
Benzidine
3,3'-Dichlorobenzidine
4-Dimethylaminoazobenzene
alpha-Naphthylamine
beta-Naphthylamine
4-Nitrobiphenyl
N-Nitrosodimethylamine
beta-Propiolactone
bis(Chloromethyl)ether
Chloromethyl Methyl ether
4,4'-Methylene-bis(2-Chloroaniline)
Ethyleneimine

Any and all unfamiliar chemicals should be checked out with the Medical Department prior to use.

H. M. COLE'S ADDRESS - PHYSICIANS' MTG., 9/78

RE: ASBESTOS

SINCE OUR LAST MEETING, IN PHOENIX, MUCH NEW INFORMATION HAS SURFACED, REGARDING THE OCCUPATIONAL HEALTH ASPECTS OF ASBESTOS. THIS, COUPLED WITH RECENT FEDERAL REGULATICNS DEALING WITH ACCESS TO MEDICAL RECORDS AND EMPLOYEE EXPOSURE INFORMATION, I THINK, WARRANTS SOME REPETITION ON THE SUBJECT.

I AM SURE THAT MOST OF YOU KNOW THAT OSHA PROMULGATED ITS FIRST ASBESTOS STANDARD IN JULY 1972. THE STANDARD SET A 5 FIBERS/CC, 8-HOUR TIME-WEIGHTED AVERAGE EXPOSURE, WITH A CEILING LEVEL OF 10 FIBERS/CC, NOT TO BE EXCEEDED IN ANY 15 MINUTE PERIOD. IT ALSO ESTABLISHED THAT THE STANDARD WOULD BE LOWERED TO 2 FIBERS/CC IN JULY 1976.

THE STANDARD REQUIRED THAT ENGINEERING CONTROLS AND WORK PRACTICES BE INSTITUTED TO REDUCE EMPLOYEE EXPOSURE TO WITHIN ACCEPTABLE LEVELS. THE STANDARD SPECIFICALLY STATED THAT RESPIRATORS COULD NOT BE USED AS ACCEPTABLE CONTROL MEASURE, EXCEPT IN CASES OF EMERGENCY, OR UNTIL ENGINEERING CONTROLS COULD BE INSTALLED. IN ADDITION, THE STANDARD REQUIRED A VERY EXTENSIVE INDUSTRIAL HYGIENE MONITORING AND MEDICAL SURVEILLANCE PROGRAM. ALL PLACES OF EMPLOYMENT WHERE ASBESTOS FIBER WAS THOUGHT TO BE RELEASED HAD TO BE MONITORED WITHIN 6 MONTHS, AND MEDICAL EXAMINATIONS OFFERED TO ALL AFFECTED EMPLOYEES.

OSHA STANDARD FOR ASBESTOS -

MEDICAL SURVEILLANCE REQUIREMENTS INCLUDE:

1) CHEST X-RAY (POSTERIOR AND ANTERIOR, 14-17 INCHES).
2) MEDICAL HISTORY TO ELICIT SYMPTOMATOLOGY OF RESPIRATORY DISEASE.
3) PULMONARY FUNCTION TEST (TO INCLUDE FVC AND $FEV_{1.0}$).

IN ADDITION, SIMILAR EXAMINATIONS WERE REQUIRED ON PREPLACEMENT, FOR EMPLOYEES ASSIGNED TO JOBS HAVING AN ASBESTOS EXPOSURE, AS WELL AS FOR EMPLOYEES TERMINATED WHO HAD HAD A PREVIOUS EXPOSURE.

ANOTHER FAR-REACHING PART OF THIS RULEMAKING INVOLVED EMPLOYEE NOTIFICATION. IF EXPOSURE MONITORING INDICATED LEVELS ABOVE THE STANDARD, IT WAS REQUIRED THAT THE EMPLOYEE BE NOTIFIED IN WRITING OF THIS EXPOSURE, AS WELL AS THE ENGINEERING STEPS BEING TAKEN TO REDUCE SUCH EXPOSURE. EMPLOYERS, THEN, FOR THE FIRST TIME, WERE REQUIRED TO KEEP AND MAINTAIN EMPLOYEE EXPOSURE INFORMATION AND MEDICAL RECORDS, REGARDING A SPECIFIC AIR CONTAMINANT ---ASBESTOS.

IN LATE 1972, THE MEDICAL DEPARTMENT SET OUT TO EVALUATE THE COMPANY'S USAGE OF ASBESTOS, AS WELL AS ESTABLISH A PROGRAM FOR COMPLYING WITH THE OSHA STANDARD. WE DEVELOPED AN IN-HOUSE CAPABILITY TO MEASURE ASBESTOS LEVELS AND INITIATED OUR INDUSTRIAL HYGIENE MONITORING PROGRAM.

IT WAS DETERMINED EARLY-ON THAT ASBESTOS EXPOSURE WITHIN THE COMPANY WAS MUCH MORE OF A PROBLEM THAN ORIGINALLY THOUGHT, AND THAT SIMPLE ELIMINATION WAS GOING TO BE AN EXTREMELY DIFFICULT TASK. I THINK DR. IRBY'S MEMO OF MARCH 1973, SUGGESTING THAT "ALL WORKING AND MACHINING OF ASBESTOS-CONTAINING PRODUCTS BE PROHIBITED, UNTIL SUCH OPERATIONS COULD BE BROUGHT INTO COMPLIANCE WITH OSHA GUIDELINES"- LAID THE GROUNDWORK FOR OUR VERY POSITIVE PROGRAM FOR DEALING WITH ASBESTOS.

WHILE THERE WERE OUTCRIES, SUCH AS:

WHAT ARE YOU DOING, TRYING TO SHUT US DOWN?
WE CAN'T LIVE WITHOUT ASBESTOS!
THERE ARE NO SUBSTITUTES FOR ASBESTOS!

...SUCH REMARKS WERE SHORT-LIVED, AND WE GOT ON WITH THE OBJECTIVE OF ASBESTOS SUBSTITUTION AND ELIMINATION. TODAY, I FEEL WE HAVE MADE SIGNIFICANT PROGRESS TOWARD THIS OBJECTIVE. IN PARTICULAR, WITHIN THE REDUCTION DIVISION, BUT MORE RECENTLY, THE MILL PRODUCTS DIVISION HAS MADE A CONCERTED EFFORT TOWARD IDENTIFYING AND ELIMINATING ALL USES OF ASBESTOS.

WE HAVE:

1) INSTITUTED AN INDUSTRIAL HYGIENE MONITORING AND MEDICAL SURVEILLANCE PROGRAM, IN ORDER TO COMPLY WITH THE STANDARD.

2) ELIMINATED MANY USES OF ASBESTOS, SUCH AS DOUGHBALLS FOR PLUGGING FURNACES AND ASBESTOS-CONTAINING INSULATION.

3) Eliminated all machining of Marinite containing asbestos, except at our Massena Reduction Plant.

4) Established on-going research programs to find asbestos substitutes for Marinite inserts and hot metal floats.

5) In some plants - established procedures for demolition and removal of asbestos previously installed, which has become worn and frayed.

6) Instituted waste disposal procedures for asbestos-containing materials.

7) Through our Respirator Training Programs - attempted to educate employees as to the hazards of asbestos.

As a result of this effort, I feel that our major problem with asbestos today is THE FOLLOWING OF THE EMPLOYEES THOUGHT TO HAVE HAD PREVIOUS EXPOSURE, AND THE REMOVAL OF ASBESTOS ALREADY IN PLACE. Certain plants, of course, like Sherwin and Hurricane Creek, will have a more difficult problem with this than others, since use of asbestos as an insulator in those plants is the most extensive.

The reason I have chosen to review the asbestos standard again is that I feel this standard sets the format for future standards on other chemical or physical agents and, more or less,

DICTATES OUR FUTURE INDUSTRIAL HYGIENE AND MEDICAL SURVEILLANCE EFFORTS, REGARDING OCCUPATIONAL EXPOSURE. JUST TO GIVE YOU AN IDEA OF WHAT CHANGES ARE TAKING PLACE IN STANDARDS TODAY --- IN 1975, OSHA PRESENTED ANOTHER STANDARD PROPOSAL FOR ASBESTOS, RECOMMENDING THE LOWERING OF THE PRESENT STANDARD OF 2 FIBERS/CC TO ONE-HALF FIBER/CC. MEDICAL SURVEILLANCE REQUIREMENTS OF THE NEW PROPOSAL WOULD REQUIRE - IN ADDITION TO WHAT WE HAVE ALREADY DISCUSSED - SPUTUM CYTOLOGY FOR EMPLOYEES WITH 10 OR MORE YEARS OF EXPOSURE TO ASBESTOS, OR FOR EMPLOYEES 45 YEARS OF AGE OR OLDER, HAVING AN ASBESTOS EXPOSURE. IT ALSO REQUIRES THAT THE EMPLOYER OBTAIN A PHYSICIAN'S WRITTEN OPINION, REGARDING THE EXAMINATION OF THE EMPLOYEE. THIS WRITTEN OPINION WOULD INCLUDE, AND I QUOTE:

"(6) PHYSICIAN'S WRITTEN OPINION. (I) WITH RESPECT TO EACH EXAMINATION REQUIRED BY THIS PARAGRAPH, THE EMPLOYER SHALL OBTAIN A WRITTEN OPINION FROM THE EXAMINING PHYSICIAN, CONTAINING THE FOLLOWING:

(A) THE PHYSICIAN'S OPINION AS TO WHETHER THE EXAMINED EMPLOYEE HAS ANY MEDICAL CONDITIONS WHICH WOULD PLACE THE EMPLOYEE AT INCREASED RISK OF MATERIAL IMPAIRMENT OF HIS OR HER HEALTH FROM EXPOSURE TO ASBESTOS FIBERS, OR WHICH WOULD DIRECTLY OR INDIRECTLY, BE AGGRAVATED BY SUCH EXPOSURE;

(B) ANY RECOMMENDED LIMITATIONS UPON THE EMPLOYEE'S EXPOSURE TO ASBESTOS FIBERS, OR UPON THE USE OF PROTECTIVE CLOTHING AND EQUIPMENT, SUCH AS RESPIRATORS; AND

(C) A STATEMENT THAT THE EMPLOYEE HAS BEEN INFORMED BY THE PHYSICIAN OF ANY MEDICAL CONDITIONS WHICH REQUIRE FURTHER EXAMINATION OR TREATMENT.

(II) THE WRITTEN OPINION SHALL NOT REVEAL SPECIFIC FINDINGS OR DIAGNOSES UNRELATED TO OCCUPATIONAL EXPOSURE TO ASBESTOS FIBERS.

(III) A COPY OF THE WRITTEN OPINION SHALL BE PROVIDED TO THE AFFECTED EMPLOYEE."

AS YOU CAN SEE, YOU ARE BEING DRAWN INTO THE PICTURE MORE AND MORE, AND, IN MY OPINION, THE LEGAL RESPONSIBILITIES ARE INCREASING FOR THE BOTH OF US.

JUST TO GIVE YOU SOME IDEA ABOUT THE MEDICAL SURVEILLANCE REQUIREMENTS OF OTHER STANDARDS, I WOULD LIKE TO REVIEW THE FOLLOWING TABLE.

NOW, YOU MAY REMEMBER, IN 1972 OSHA ADOPTED THE THRESHOLD LIMIT VALUES (TLV'S) AS INTERIM HEALTH STANDARDS. THE OSHA ACT REQUIRED THAT THESE STANDARDS BE UPDATED AND PROMULGATED AS PERMANENT STANDARDS. TO DATE, ONLY 8 PERMANENT STANDARDS HAVE SURVIVED THE FINAL RULEMAKING PROCESS, OUT OF APPROXIMATELY 400 (THE ORIGINAL LIST OF THRESHOLD LIMIT VALUES). HOWEVER, THE IMPACT OF THESE 8 HAS BEEN FAR-REACHING, INDEED.