

To: Mr. J. W. Whittlesey
46th Floor
NEW YORK OFFICE

Date: October 28, 1980

10/28/80

From: Ron Ritchie

Re:

Attached is a copy of the paper that Dr. Leffingwell wrote for presentation at the New York Academy of Sciences. Dr. Glenn and John Carvajal are listed on the cover page as authors but in the final version their names do not appear.

Dr. Glenn has already forwarded a copy of this paper to Walt r Conrad.

By way of information, Leffingwell did not present this paper. He was unable to make it due to "family illness". The paper, however, was not withdrawn.

A. G. VORESS~
270 PARK AVENUE.

331-4061

John
For your info
Arline
J W Whittlesey

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Brain Cancer Cluster Investigation
at the
Union Carbide Corporation Plant
Texas City, Texas

Sanford S. Leffingwell, MD, MPH
Richard Waxweiler, PhD
David Glenn, MD
John Carvajal, --
Victor Alexander, MD, MSPH

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Introduction:

In February of 1979, The National Institute for Occupational Safety and Health (NIOSH) of the Department of Health and Human Services, the Occupational Safety and Health Administration (OSHA), of the Department of Labor, and the Union Carbide Corporation began an investigation of a cluster of brain tumors at the company's Texas City, Texas plant. The initial events and the characteristics of the cases have been described by Dr. Victor Alexander. We here describe the conduct and present status of a case-control study of occupational histories of employees of that plant who developed primary brain tumors.

Methods and Materials:

The method of case identification has been described by Dr. Alexander; the company was able to identify 12 cases, matching company records with lists of all adult males who were residents of surrounding counties and who died of malignant brain tumors yielded four more cases, three additional cases became ill and died during the course of the study, and three cases have been found so far in the course of determining the vital status of all workers ever employed in the plant. Medical records and tissue specimens were obtained, where possible, and a best diagnosis was chosen from the available evidence.

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Following the advice of Schoenberg et al., we included all deaths due to primary intracranial neoplasms except those of the pituitary. This excluded one case with a metastatic lesion and one with a congenital anomaly but with no tumor found at autopsy. Two of the most recently discovered cases have not been included, pending confirmation of the diagnosis. Analyses of the residual 18 cases will be done both for the group as a whole and for the 15 proven gliomas.

For each employee, the company completed coding sheets containing identifying personal data, date of each new job title or department code, job code, department accounting code, and date of each layoff or date of termination. Vital status was coded, when known. Every 50th record was copied and sent to NIOSH for independent verification of coding. A random sample of the original records will be drawn by NIOSH and used for verification of completeness of cohort identification.

Six controls were drawn for each case from the pool of all people ever employed at the plant. Cases were matched to potential controls by race and sex; date of birth was matched to within three years; date of first hire for the control was before that of the case, but not more than three years before; the date the control was last employed was later than the case's last date of employment. The control could be living but, if dead, must not have died of a malignancy. Pools of controls meeting the criteria outlined above were formed and the actual controls used were drawn by random number from the pool.

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The company provided translations for the job and department codes and provided a list of chemicals encountered in each major department group. The departmental coding schemes used for accounting purposes within the plant have changed over the years, so a common list tracing the history of each department was prepared and all codes were transformed to conform to a single coding scheme. Although catalysts have changed often, there appears to be no problem in characterizing the feedstocks, intermediate products, and output of each department through the years the plant has been in operation. ~~The task of transforming departmental chemical lists to the single departmental coding scheme mentioned above is near completion, but we cannot yet report on chemical exposures.~~

Each job, department, and major department group represented by at least three cases was tested for possible significance by the χ^2 test. Since this approach is a multiple sampling technique which should lead to about one "significant" association for every twenty jobs, departments, or exposures considered, it is used here as an hypothesis generating mechanism, not as a means of properly testing the hypotheses.

~~A map was prepared showing the addresses listed on death certificates and inspected for obvious clustering.~~

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Results:

Only one job code, "Operator" was represented by more than three cases. Table I shows the distribution of operators among the cases and controls. There is no significant difference in proportions.

When analyzed by department accounting code, only the maintenance department, with eight cases, was represented by more than three cases. Table II shows the distribution of maintenance department workers among the cases and controls. Grouping the accounting codes into major departments did not yield any new concentrations of three or more cases. There were no significant differences in proportions.

~~A map of the addresses shown on cases' death certificates shows no clustering.~~

Discussion:

✓ So far in the course of this investigation, no convincing association has been found between any historical exposure and the development of brain tumors at this plant.

When cases and controls are analyzed by chemical exposures, an additional problem will be encountered: the exact exposure of a

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maintenance man is difficult to characterize accurately, due to their mobility throughout the plant. Fortunately, this can be corrected, at least in part, by further review of existing records. Some of the maintenance department employees had reasonably well defined exposures; for example, one case was an instrument repairman whose work rarely took him out of the instrument shop. We plan to define exposures of cases and controls who worked for the maintenance department as completely as possible and study the full data set. At that time, there should also be enough information at hand to study the exposures by latency.

- It is possible that the tumors seen are the result of a more general effect or exposure. We plan to examine the geographic location within the plant of cases and controls, to see if any pattern emerges, and will attempt to determine the residence at time of first hire, to see if there appears to be any unusual clustering outside the plant.

Finally, we must ask whether we are really seeing an effect of occupation. The excess of observed over expected reported earlier², combined with an apparent excess when compared to local rates³, could be the result of chance. The reported correlations with duration of employment and latency since first employment argue against this hypothesis but do not refute it. Inquiry into exposures present in other populations with apparent excesses of brain tumors may provide needed additional clues.

2 = mark

3 = Dr Alexander's paper

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Table I: Distribution of Operators Among
Cases and Controls

IA. All Cases	Cases	Controls	Total
Operators	9	49	58
Non-operators	9	59	68
Total	18	108	126

Odds ratio = 1.2; $\chi^2 = 0.045$; p greater than 0.75

IB. Proven Gliomas	Cases	Controls	Total
Operators	7	40	47
Non-operators	8	50	58
Total	15	90	105

Odds ratio = 1.1; $\chi^2 = 0.024$; p greater than 0.75

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Table II: Distribution of Maintenance Workers
Among Cases and Controls

IIA. All Cases	Cases	Controls	Total
Maintenance workers	7	46	53
Non-maintenance workers	11	62	73
Total	18	108	126

Odds ratio = 0.86; $\chi^2 = 0.087$; p greater than 0.75

IIB. Proven Gliomas	Cases	Controls	Total
Maintenance workers	7	37	44
Non-maintenance workers	8	53	61
Total	15	90	105

Odds ratio = 1.3; $\chi^2 = 0.163$; p greater than 0.75

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in a preemployment physical to support a motion for summary judgment seeking a ruling that the employer's action did not violate the Act. Although the court recognizes that such a physical problem might justify a refusal to hire on business necessity grounds, it holds that a non-imminent risk of future injury does not permit the employer to regard the applicant as incapable of performing a job that involves heavy lifting. *E. E. Black, Ltd. v. Marshall*, 23 FEP Cases 1253 (D. Ha. 1980).

→ OSHA Developments

1. DUTY TO RECORD ARGUABLE OCCUPATIONAL ILLNESSES CLARIFIED

In a significant decision concerning an employer's obligation to record alleged occupational illnesses, the Review Commission has upheld a citation issued to General Motors Corp., Inland Division, for violations of 29 C.F.R. § 1904.2 which requires that all occupational illnesses be recorded on the OSHA Form 200 Log. *Secretary of Labor v. General Motors Corp.*, 10 OSHC 389 (Rev. Comm'n 1980). According to the unanimous decision, "employers must record illnesses in which the occupational environment either was a contributing factor to the illness or aggravated a pre-existing condition. Furthermore, employers must record illnesses when, as in this case, there is medical evidence from personal physicians linking the illness and the occupational environment and no other medical evidence contradicts the relationship."

In the present case, GM had received statements from personal physicians of three employees who were allegedly suffering "respiratory problems" and who were admittedly exposed during their employment to the toxic chemical, Toluene Diisocyanate (TDI). One physician stated that the patient's bronchitis was "possibly aggravated" by an unknown workplace chemical while a second described the employee's condition as "allergic bronchitis caused by fume inhalation." The final physician flatly stated that the employee suffered "a reversible destructive airway disease probably related to exposure to TDI." The record did not reveal what environmental records or medical qualifications the physicians used to make such determinations.

GM disputed these conclusions and stated that it had no basis upon which to conclude that the conditions were occupationally induced. Even though substantial alternative explanations were advanced

by the employer, the Commission concluded that the strong policy favoring reporting of even arguable occupational illnesses required that all of the conditions be recorded absent countervailing medical examination indicating that the conditions were not occupationally caused.

In a related development, Commissioner Cleary has directed review of an Administrative Law Judge (ALJ) decision upholding a willful citation for an employer's failure to record alleged cases of asbestos disease. *Secretary of Labor v. Amoco Chemicals Corp.*, OSHRC Docket No. 78-248 (Rev. Comm'n Aug. 28, 1980). In that case ALJ Benjamin Usher found that the employer was required to enter certain alleged illnesses in the log even though neither the employer nor any private physician had in fact "diagnosed" any occupational illness. The ALJ reasoned that voluntary pulmonary examinations of Amoco employees provided the employer with information which should have led the employer to make such a diagnosis. Since the Secretary's experts were willing to reach a diagnosis on the basis of information developed by the Secretary, the employer's outside physicians should have also made the diagnosis.

On the basis of these decisions, it now appears that both the Secretary and the Commission believe that the recordkeeping regulations impose substantial obligations not only to record diagnosed cases but also to diagnose and record all arguable occupationally-induced illnesses. As yet, no judicial resolution of these and other recordkeeping obligations has been reached.

2. REVIEW COMMISSION APPROVES SETTLEMENTS CONTAINING EXCULPATORY LANGUAGE

In a reversal of prior Commission precedent, a divided Occupational Safety and Health Review Commission has stated that the inclusion of so-called "non-admission" clauses in settlement agreements submitted to the Commission will no longer provide a basis for rejecting the agreement.

As long as the proposed settlement is consistent with the criteria set out in our decision *Dawson Bros. Mechanical Contractors*, 72 OSHARC 5/B8, 1 OSHC 1024 (1972) and Commission Rule 100, particularly as to the abatement of the alleged hazards, the statutory purpose of assuring a safe and healthful workplace is served by a prompt voluntary disposition of a contested case.

11/1/80

Union Carbide disputes evidence

OSHA names Texas City firm in study of job-related cancers

Chronicle News Services

Government occupational-health investigators say 18 brain cancer deaths among workers at the Union Carbide plant in Texas City were apparently job-related, but company officials dispute the claim.

"Information available indicates that this number of brain tumors is excessive and that the tumors are likely to be occupationally related," the government scientists said.

The investigators said it was the "largest single series of presumably occupationally related brain cancers" in medical annals.

The brain cancer deaths — four to five times as many as those projected for Galveston County under normal conditions — occurred between 1956 and 1980.

Their report, presented in New York by Dr. Victor Alexander, of the Occupational Safety and Health Administration, was based on investigations by OSHA and National Institute of Occupational Safety and Health sleuths.

Studies by OSHA, NIOSH and other agencies have also turned up 27 brain cancer cases among present and former workers at a Dow Chemical plant in Freeport since 1951.

Union Carbide officials said they know nothing about the findings released Monday by OSHA and NIOSH. They say a study, begun in March 1979 by the two government agencies and the company, is not complete.

The scientists, who did not name the plant where they probed work histories of the 18 brain cancer victims, reported at opening sessions of a three-day, government-funded New York Academy of Sciences Workshop on Brain Tumors in the Chemical Industry.

The Occupational Health & Safety Newsletter — printed privately and distributed at the meeting — identified the company in the report as Union Carbide and said:

"Company officials are expected to refute the data in the OSHA-NIOSH Report. Union Carbide does not acknowledge either an excess of brain tumors in the plant nor is it willing to link the cases to occupational exposure."

A Union Carbide spokesman, commenting on the report, said:

"Currently, we have no reason to believe there is any correlation between these tumors and occupational exposure. Our position is that Dr. Alexander's is an interim report and that more will be

learned over the next two years as company toxicologists and OSHA-NIOSH scientists continue the investigation."

Jackson B. Browning, Union Carbide's corporate director of health, safety and environmental affairs, said company officials were told six weeks ago by OSHA and NIOSH that spokesmen for both agencies would make presentations to the workshop. Browning said company officials understood that OSHA and NIOSH would present papers on the study of Union Carbide workers.

"But a version of the paper we saw was just a progress report saying that the study is proceeding," he said. "There was no new information. No new direction. I can't imagine they would release consequential information without telling us about it."

"Since it is a combined study you'd think they would have conferred with us first," said Browning.

In the report, the Union Carbide plant at Texas City was described as a diversified petrochemical manufacturing facility with a large number of major product lines. These have included ethylene, butadiene, naphtha, alcohols, plastics and resins, including vinyl chloride.

"A preliminary estimate reveals a plant-wide excess brain cancer risk twice that expected among 6,800 white males at the plant since 1941," the OSHA-NIOSH report said.

Median age of those with fatal brain cancer was 53; the youngest was 30 and the oldest 66. Median employment was 21 years.

Dr. Ralph Cook, head of epidemiology for Dow, noted that 20 of the 27 victims at Dow were hired between 1940 and 1946, a time when the average age of a new hire was 10 years older than today owing to younger people being drained off by the war effort.

Cook said that, based on the older age at time of hire, some 24 of the 18,000 people who worked at Dow during this period could be expected to die of brain cancer.

Dr. Anthony Robbins of NIOSH said the government didn't get into the petrochemical and cancer situation very deeply until two years ago.

"If anything it seems we are slow for workers still in the industry and possibly exposed," he said.

"If workers are exposed to something that causes this cancer we can be almost certain that the malignancy can be prevented."

Ron Richey, employee relations

manager for Union Carbide in Texas City, accused the government agencies of violating a "protocol agreement."

"We all signed an agreement saying that one party was not to issue a statement (on the study) without notifying the other parties," said Richey. "I don't understand what's going on."

Company officials say the study that is tracing the backgrounds of some 8,900 past and present Union Carbide employ-

ees is about five months from completion.

An American Cancer Society epidemiologist said brain cancer deaths nationally have grown about 50 percent since 1940.

Other scientists questioned whether the national rate of brain cancer was really rising. Dr. Leonard Kurland of the Mayo Clinic said his studies have shown the brain cancer rate has been steady for the last few decades near the clinic in Rochester, Minn.

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