U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES ■ Public Health Service
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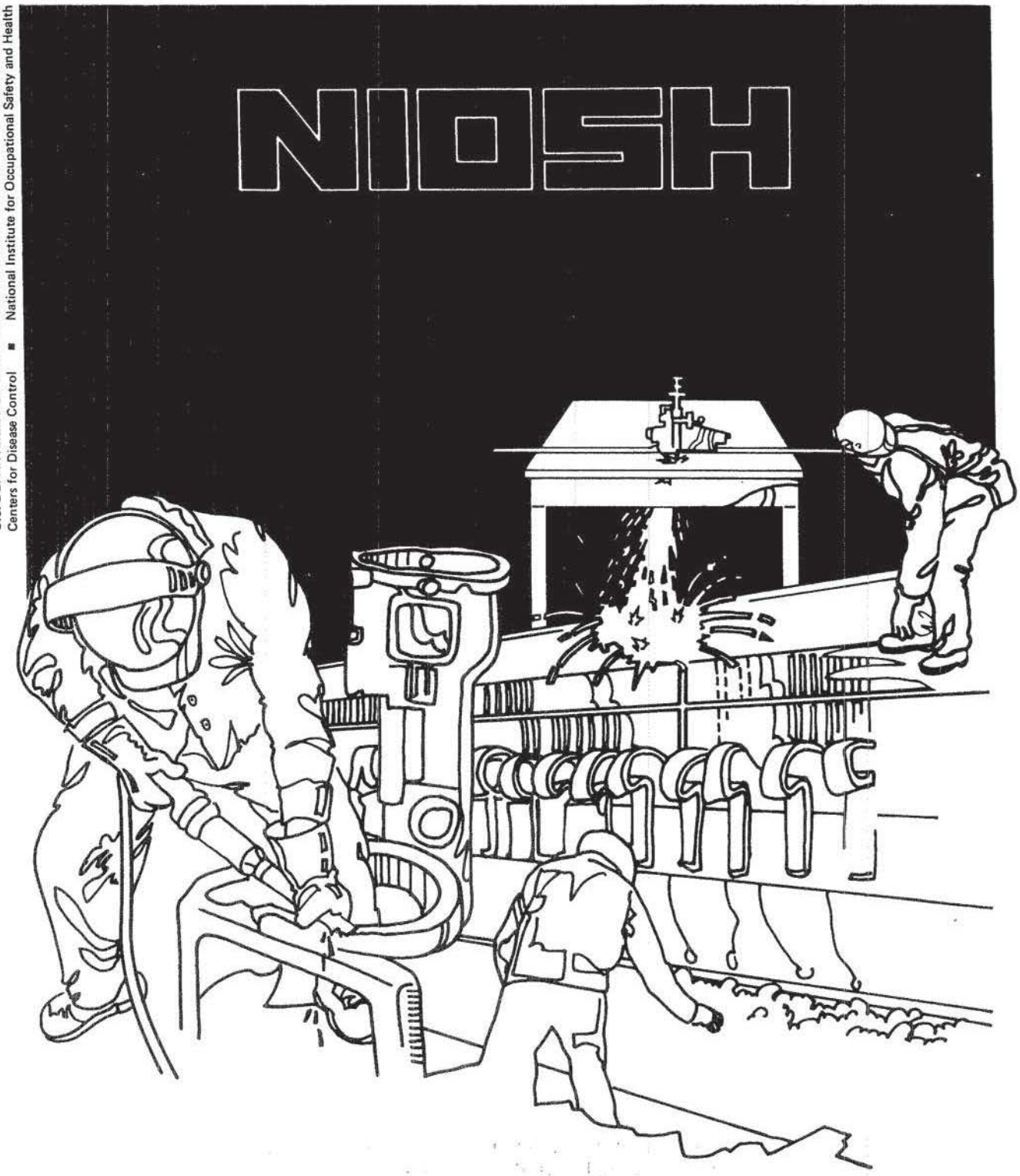

Health Hazard Evaluation Report

HETA 81-074-858
NEWTON PUBLIC SCHOOLS
NEWTON, MASSACHUSETTS

PREFACE

The Hazard Evaluations and Technical Assistance Branch of NIOSH conducts field investigations of possible health hazards in the workplace. These investigations are conducted under the authority of Section 20(a)(6) of the Occupational Safety and Health Act of 1970, 29 U.S.C. 669(a)(6) which authorizes the Secretary of Health and Human Services, following a written request from any employer or authorized representative of employees, to determine whether any substance normally found in the place of employment has potentially toxic effects in such concentrations as used or found.

The Hazard Evaluations and Technical Assistance Branch also provides, upon request, medical, nursing, and industrial hygiene technical and consultative assistance (TA) to Federal, state, and local agencies; labor; industry and other groups or individuals to control occupational health hazards and to prevent related trauma and disease.

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NEWTON PUBLIC SCHOOLS
NEWTON, MASSACHUSETTS

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I. SUMMARY

On November 10, 1980, the National Institute for Occupational Safety and Health (NIOSH) received a request for a Health Hazard Evaluation from a representative of the Newton Public Schools, Newton, Massachusetts. The request stated that in the past year, three females working in the Administration printing room have developed ovarian cysts. The request identified Xerox 9200/9400 toner and binding adhesives as possible air contaminants in the room. An environmental evaluation was conducted by NIOSH on November 20, 1980. A NIOSH physician subsequently obtained information from the physicians of all three women who reported having ovarian cysts.

Air samples did not indicate appreciable concentrations of: respirable dust, ozone, chlorinated hydrocarbons, carbon monoxide, or alcohol. A review of pertinent literature revealed that Xerox 9200/9400 toner does not contain nitropyrenes, and did not produce mutagenic activity in laboratory tests.[1]

A review of employee medical records confirmed two cases of ovarian cysts, one of which occurred so soon after the woman began work that the cyst might well have begun developing prior to her working there.

Based on the data obtained in this investigation, NIOSH determined that a health hazard did not exist in the printing room and that the presence of ovarian cysts, in the absence of appreciable chemical exposure, should not be presumed to have occupational origin.

KEYWORDS: SIC 8211 (Schools), XEROX machines, toners, ovarian cysts

II. INTRODUCTION

On November 10, 1980, the Director, Technical Vocational Education, Newton Public Schools, submitted a request for a Health Hazard Evaluation in the printing room of the Administration Building, 100 Walnut Street, Newton, Massachusetts. The request stated that three female employees had experienced cysts on their ovaries in the past year and are concerned whether the cysts were occupationally related. Substances identified by the requestor were Xerox 9200/9400 toner and book binding adhesives.

NIOSH conducted a field investigation on November 20, 1980.

III. BACKGROUND

The majority of the duplication activities for the Newton Public School System are performed at the Administration building. Here, five part-time, work-study students and one full-time production manager are employed in duplication. About 90% of this activity is done using a Xerox 9400 duplicator. Small job reproducing is performed on a smaller Xerox machine located outside the main production room. Some orders require binding. A 3M latex padding adhesive is used for this purpose.

In April 1980 it was reported through the news media that certain toners contained a chemical that gave indications of being a possible health hazard in certain short-term tests. The production manager immediately contacted the Xerox Corporation for information about this report. On April 23, 1980 the production manager received a letter from Xerox headquarters which quoted an EPA news release "... the public should not be alarmed about the safety of using their present copiers or current copying practices..."

The three reported cases of ovarian cysts all occurred between the fall of 1979 and the summer of 1980. With the possibility that the cysts were occupationally induced, the employees asked the School Department to request a health hazard evaluation.

IV. EVALUATION DESIGN AND METHODS

A. Environmental

A review of the pertinent literature was performed to determine if Xerox 9200/9400 toner contained the reportedly hazardous chemical: nitropyrene(s). General area samples were collected using detector tubes as a quick screening method for ozone, carbon monoxide, alcohol, and chlorinated hydrocarbons. Direct reading measurements for respirable dust were made using a GCA Respirable Dust Monitor.

B. Medical

A NIOSH physician obtained information from the physicians of all three women who reported having ovarian cysts.

V. EVALUATION CRITERIA

Airborne exposure limits for the protection of the health of workers have been recommended or promulgated by several sources. These limits are established at levels designed to protect workers occupationally exposed to a substance during an 8-10 hour day, 40 hour week based over a normal working lifetime. For this investigation, the criteria used to assess the degree of health hazards to workers were selected from three sources: 1) NIOSH: Criteria for a Recommended Standard...Occupational Exposure to various substances; 2) Threshold Limit Values (TLV): Guidelines for Airborne Exposures as Recommended by the American Conference of Governmental

Industrial Hygienists (ACGIH) for 1980; 3) OSHA Standards: the air contaminant standards by the U.S. Department of Labor - Occupational Safety and Health Administration as found in the Federal Register - 29 CFR 1910.1000 (Tables Z-1 and Z-2).

For the purposes of this report, the NIOSH recommended standard will be the environmental criteria applied since it represents the most recent knowledge concerning a substance. If one does not exist, the next most stringent recommended level or legal standard will be used.

Substance	NIOSH	ACGIH	OSHA
Carbon Monoxide	35 ppm	50 ppm	50 ppm
Ozone	--	0.1 ppm	0.1 ppm
Respirable Dust	--	5 mg/M^3	5 mg/M^3
Carbon Black	3.5 mg/M^3	3.5 mg/M^3	3.5 mg/M^3
1-1-1 Trichloroethane	350 ppm(C)	350 ppm	350 ppm
Isopropyl Alcohol	400 ppm	400 ppm	400 ppm
Methyl Alcohol	200 ppm	200 ppm	200 ppm

Concentrations, in parts of substance per million parts of air (ppm) and milligrams of substance per cubic meter of air mg/M^3 are based on an 8-hour Time Weighted Average (TWA) exposure. Values designated (C) represent concentrations which should not be exceeded as commonly measured in a 15-minute period.

VI. EVALUATION RESULTS AND DISCUSSION

A. Environmental

It was learned from the literature[1,2] that certain Xerox toners contained

carbon black with nitropyrene contamination. Short-term salmonella tests have given positive responses to these toners. Xerox 9200/9400 toner was tested and did not contain nitropyrenes. Also Xerox 9200/9400 toner did not produce mutagenic activity in the short-term salmonella test.

The results of the detector tube sampling is summarized in Table 1. These results do not indicate appreciable concentrations of any of the sampled substances. Respirable Dust concentrations of 0.29 mg/M^3 and Total Dust concentrations of 0.40 mg/M^3 were measured. These results are well below the evaluation criteria for this report and therefore do not represent a hazardous level.

B. Medical

One of the three women did not have an ovarian cyst; she had an unrelated gynecologic disorder. In one of the two confirmed cases, symptoms apparently related to the ovarian cyst occurred so soon after the woman began working in the duplicating room that the cyst might well have begun developing prior to her working there.

C. Conclusion

Ovarian cysts are not rare, so the occurrence of two cases among three women in the same workplace is not necessarily indicative of an occupational etiology. In this case, since no appreciable chemical exposure was identified, no occupational etiology should be presumed.

VII. REFERENCES

1. Rosenkranz, Herbert S., McCoy, Elena C., et al. "Nitropyrenes: Isolation, Identification, and Reduction of Mutagenic Impurities in Carbon Black and Toners", Science Vol 209: 1039-1043, 1980.

2. Lofroth, G. and Hefner, E. "Mutagenic Activity in Photocopies", Science Vol 209: 1037-1039, 1980.

3. "Criteria for a Recommended Standard...Occupational Exposure to Carbon Black", DHEW(NIOSH) Pub No. 78-204, September 1978.

4. "Occupational Diseases: A Guide to their Recognition", DHEW(NIOSH) Pub No. 77-181, Revised June 1977.

VIII. AUTHORSHIP AND ACKNOWLEDGEMENTS

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IX. DISTRIBUTION AND AVAILABILITY OF DETERMINATION REPORT

Copies of this report are currently available, upon request, from NIOSH, Division of Technical Services, Publications Dissemination, 4676 Columbia Parkway, Cincinnati, Ohio 45226. After 90 days, this report will be available through the National Technical Information Service (NTIS), Springfield, Virginia 22161.

Copies of this report to:

1) Newton Public Schools, 100 Walnut Street, Newton, Massachusetts
2) U.S. Department of Labor, OSHA, Region I
3) NIOSH, Region I
4) U.S. Department of Labor, OSHA National Office
5) Massachusetts Department of Labor and Industries
   Division of Occupational Hygiene

TABLE 1

Summary of Sample Results

Newton Public Schools

11-20-80

Substance	Results
Carbon Monoxide	5 ppm
Ozone	< .05 ppm
Chlorinated Hydrocarbons	< 10 ppm
Alcohols	< 10 ppm

All samples were collected in the general area of the Xerox 9400 duplicating machine.

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