

WOHRC NEWS

WOMEN'S OCCUPATIONAL HEALTH RESOURCE CENTER
SCHOOL OF PUBLIC HEALTH
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• • Briefly Noted • •

TWO U.S. GOVERNMENT REPORTS have stirred up controversy and brought serious public objections, particularly from organized labor. The first is the results of a joint mortality study on formaldehyde, by the National Cancer Institute and the Formaldehyde Institute, an industry association, which provides "little evidence to suggest that formaldehyde exposures affected ...mortality" Labor experts question the interpretation and the methods of exposure estimation. (See page 2 for an analysis of this study.)

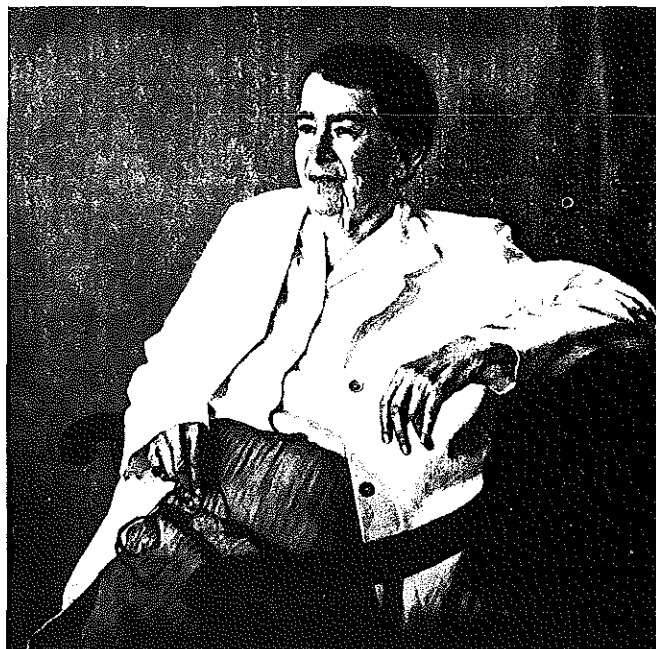
The Surgeon General's annual report on smoking and health, which emphasizes worker smoking habits as the main cause of cancer, rather than occupational exposures, has also been hotly contested. To date, although the book is available, it has not been officially released and many predict it may never be. A NOMINEE TO HEAD OSHA has been named by President Reagan. He is John A. Pendergrass, currently manager of hazards awareness products for 3M Company in St. Paul, Minn. Pendergrass is an industrial hygienist with experience in private companies and the Tennessee Valley Authority. Nominations must be confirmed by the U.S. Senate.

CANCER CHEMOTHERAPEUTIC AGENTS, the drugs administered to cancer patients, are in the medical news again as researchers at the U.S. and Finnish Institutes for Occupational Safety and Health report a statistically significant association between exposure to the agents during the first trimester of pregnancy and fetal loss. The exposed nurses were 2.3 times as likely to abort. This study is a follow-up on earlier suggestive data observed in a study of reproductive outcomes and anesthetic gas exposure in Finnish nurses. (A literature review on cancer chemotherapeutic agents is available from WOHRC, see page 5).

THE COAL EMPLOYMENT PROJECT will hold its Eighth National Conference of Women Miners in Paintsville, Ky on June 27-29. The group has represented the interests of the growing number of women miners who work in fields from Utah to Pennsylvania, and Wyoming to Alabama.

WOHRC DIRECTOR JEANNE STELLMAN has been named the new editor of *Women and Health*, a multidisciplinary academic journal devoted to the study of women's health. The Spring 1986 issue, Volume 11(1) will be the first under her editorship and will feature several important articles on the relationship between women's roles and their health.

A NEW CURRICULUM GUIDE ON REPRODUCTIVE HAZARDS has been published by the American Association of Occupa-



Hardy Portrait Unveiled

ON THE INSIDE

Controversial Formaldehyde Report—What does it say?
Methylene Chloride Guidelines
Reproductive Health—Still a fertile issue

Harriet L. Hardy, MD, an outspoken and steadfast pioneer in occupational medicine was honored by Harvard Medical School when her portrait was unveiled on March 21 by the Dean. Dr. Hardy, a student and collaborator of Dr. Alice Hamilton, whom many consider the "mother of occupational health" has made important contributions such as understanding of beryllium disease. She has recently published an autobiography "Challenging Man-Made Disease," which is available from WOHRC (see page 5).

tional Health Nurses. It was produced as part of a March of Dimes Professional Education grant which also provides training for AAOHN members. The guide (available through WOHRC, see page 5) provides an illustrated overview of mechanism and toxic agents. A WOMEN'S HEALTH BOOKLET SERIES "Know Your Body" has been published by Health-Pac (17 Murray Street, New York NY 10007) and provides inexpensive, concise, accessible information on breast cancer, gynecological exams and other issues relevant to women's health.

Formaldehyde Hazards—A Controversial Report

A widely publicized study carried out by researchers at the National Cancer Institute, under the sponsorship of the Formaldehyde Institute, an industry association, finds "little evidence to suggest that formaldehyde exposures affected the mortality experience" of the 26,561 workers. However, many experts are critical both of the study design and of the interpretation of the data collected. The following summary of some results and the methodology is based on a prepublication copy of the study obtained by WOHRC, followed by critical analysis.

The study method: 10 plants with the largest number of employees and longest formaldehyde use were selected from approximately 200 companies that used formaldehyde. Most of these plants used the formaldehyde in different processes. Workers employed before 1966 were included in the study. Government and company records were searched to find if the workers were still alive, or their cause of death on the death certificate.

Rates of death were compared to people of the same age, race and sex in the United States. An "exposure matrix" for each worker was retrospectively constructed by industrial hygienists researching production history at each plant and workers' job titles. Current air samples were taken but no data on exposure levels over the years was available. In most analyses workers exposed for different lengths of time and different conditions were combined into ppm-years groups (number of estimated parts per million of exposure times the length of time spent exposed at that level summed over levels.) Latency, or the period of time needed for cancer to develop, was considered in some calculations, but not in all.

Who are the researchers? The research group was headed by Aaron Blair, Occupational Epidemiology Group, National Cancer Institute. It was sponsored and funded (with NCI internal support as well) by the Formaldehyde Institute, represented by epidemiologists from Dupont and Monsanto. Researchers from Westat, Inc, and Dynamac Corporation, private consulting firms, were on the team.

Summary of findings: The report presents a large amount of data on death rates from various causes among 'exposed' and 'non-exposed' workers. The data given here focusses on lung cancer and on cancer of the nose and throat because similar types of cancer were observed in the test animals exposed.

The reported lung cancer mortality ratios were significantly higher for wage than salary workers. (A ratio greater than 100 indicates an higher rate.) Significant increases in nasopharyngeal and oropharyngeal

	Standardized Mortality Ratios (Number of deaths in parentheses) (ppm-years)			
	0	<0.5	0.5-5.5	>5.5
Lung Cancer:				
wage	(7) 86	(79) 128*	(78) 115	(55) 123
salary	(5) 50	(4) 94	(7) 43*	(7) 64
wage > 20 yrs 1st exposure	(5) 97	(49) 135	(53) 135	(44) 132
Nasopharyngeal Cancer†:				
all workers; latency ignored	(1) 530	(2) 271	(2) 258	(2) 433
Oropharyngeal Cancer†:				
all workers; latency ignored	(0) --	(4) 443*	(1) 95	(0) --

* statistically significant, $p < 0.05$
 † [These 12 cases represent statistically elevated risk of almost 2.6-fold. Other mouth sites omitted because of small numbers reported. —WOHRC]

ng cancer were also observed. No statistically significant trends of increased cancer with increased exposure were observed.


The researchers' conclusions: Although statistically significant increases in lung and other cancers were found, since no relationship was observed between increasing doses and amount of disease, the increased rates could not be related to formaldehyde.

Some questions and criticisms: Critics have raised the following questions and criticisms. Effect should be related to exposure. However, the exposures studied here are very low, so an effect may not be observable. The current OSHA standard is an average of 3 ppm. The researchers rounded the highest group exposure to 2.5 ppm. Unions have petitioned for a new OSHA standard of 1 ppm, a higher level than most workers considered exposed in this study. The levels to which test animals were exposed were very much higher than the highest human exposures, taking the size difference into account. All this means that most of the workers in this study were exposed to levels far below the current or proposed standards and not to the high levels of formaldehyde probably needed statistically to observe a human effect.

Further, the use of statistical trend analysis requires precise knowledge of the exposures. Exposures here are extremely uncertain. Thus the statistical validity of the trend test is questionable.

The difference between the cancer rates in wage and salary earners appears to indicate that the greater direct contact with chemicals among wage earners places them at greater cancer risk which may or may not be attributable to formaldehyde. Rather than being negative for formaldehyde, this study, critics say, shows excess pharyngeal cancers and possible other excesses as well and can be considered a positive rather than negative report.

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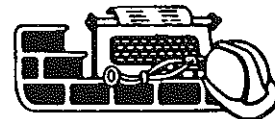


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Cosmetology: Is Beauty a Risky Business?

Union Petitions for Labelling; FDA Cites High Risk

Almost 300,000 people, the great majority of them female, are employed as cosmetologists or barbers. In recent years several studies have found cosmetologists to have elevated rates of breast, digestive system and respiratory cancer, as well as an increased incidence of miscarriages and premature births. In addition, the toxicity of individual chemicals used in cosmetics, such as formaldehyde and methylene chloride is well established.

While manufacturers must provide the ingredients of beauty products used by consumers, products for commercial use in salons and barber shops are generally unlabelled. The United States Court of Appeals has recently ruled that ingredient labels be required for all industries under OSHA's Hazard Communications Standard, but OSHA has not yet extended this standard to cover the beauty industry.

Union Petitions for Labelling

The United Food and Commercial Workers Union (UFCW), which represents 40,000 barbers and cosmetologists petitioned OSHA in February 1986 to require that manufacturers label all cosmetic products with their ingredients. The UFCW has also petitioned the Food and Drug Administration, FDA, for a ban on methylene chloride, a commonly used propellant in cosmetics (see p.5) and for investigation of formaldehyde and nitrosamines, commonly used cosmetics preservatives which have been associated with a variety of toxic effects, including cancer.

Some industry experts agree with the need for ingredient identification arguing that "labeling professional product ingredients will not only help stylists, but will also help clients. If, for example, a client has an allergic reaction and a doctor suspects the allergy may come from one of the beauty treatments, (the cosmetologist) can immediately tell the doctor what's in the shampoo, perm, etc.," according to the trade journal *Cutter Hotline*." The stylist can also make intelligent substitutions of products with less toxic substances, the journal points out.

FDA Ban on Methylene Chloride

The FDA proposed a ban on the use of methylene chloride as an ingredient in aerosol cosmetic products in December 1985, citing several toxicological studies which established that inhalation of the chemical causes chemicals in laboratory test animals. In its proposed ruling, the FDA notes that "hair care

(continued)



Cosmetologists can be exposed to a wide range of occupational hazards, such as nickel and other heavy metals in dyes and shampoos. Metals can cause serious allergic skin conditions. Continually wetting the hands during shampoos or cutting wet hair also makes the skin even more susceptible to chemicals and to cuts from instruments and human hair itself. It permits easier entry of chemicals into the body through the skin.

Hair dyes can contain chemicals associated with cancer. Many products are used in aerosol form which makes their inhalation and penetration into the lungs more likely. Some preservatives, which inhibit microbial growth in the cosmetics, are toxic and even carcinogenic. Formaldehyde and nitrosamines are two examples.

Chemicals aren't the only occupational hazard for beauty industry workers who spend many hours standing or in other work postures which stress the body. The delivery of personal services to the public is also stressful, particularly where there may be problems "pleasing" the customer. Heavy time pressures are common during busy work periods like Saturday mornings.

Cosmetology Risks (cont'd.)

specialists represents the groups with the highest exposure level from aerosol hair sprays."

The Agency cites published data showing that consumer use of a spray for 5 seconds will cause 50 parts per million of methylene chloride to remain in the breathing zone for 5 to 10 minutes after spraying. This study was carried out by researchers at Dow Chemical and Alberto Culver companies. Cosmetologists would be exposed for far greater lengths of time.

"For the hair specialist, the lifetime (cancer) risk is 1 in 100 to 1 in 1000" according to FDA estimates.

When the FDA calculated the risk based on the cancer induction rate observed in mice exposed to 2,000 parts per million of methylene chloride, it estimated that the lifetime cancer risk for cosmetologists is between 1 in 100 to 1 in 1000. (Using the same calculation for consumers, the risk was calculated to be between 1 in 1,000 to 1 in 10,000.)

Aerosols: a particular hazard

The FDA notes in its analysis that the "risks are relatively high" for hair stylists not because methylene chloride is a particularly potent carcinogen but because the exposures from aerosol uses are high.

Other aerosols will also pose special hazards. For example, the Cosmetics Ingredient Review Expert Panel, a cosmetics industry sponsored group, has concluded that while formaldehyde is safe for use as an additive in low concentrations to lotions and other cosmetic products, it "cannot be concluded that formaldehyde is safe in cosmetic products intended to be aerosolized."

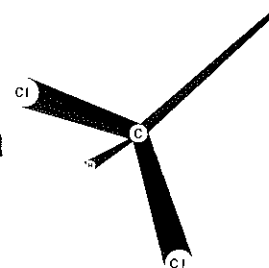
Cancer risks from aerosolized hairsprays are not new. Vinyl chloride was a very popular "inert" propellant previously used for this purpose until it was found to be a human carcinogen when a cluster of liver cancers was discovered among vinyl chloride manufacturing workers. It is no longer used as a propellant.

Eliminate aerosols for safety

One method that has been recommended by WOHRC and other experts for minimizing aerosol hazards is to substitute hair setting lotions or manually propelled sprays. If aerosols are considered necessary, then stylists should try to obtain sprays that utilize carbon dioxide propellants. Care should be taken to avoid spraying the customer's eyes. All cosmetic products should be used in well ventilated spaces.

Other prudent chemical safety precautions include wearing gloves when applying dyes, permanent waving lotions and hair straightening chemicals. Wherever possible safer substitutes, such as vegetable dyes for chemical ones, should be used. The UFCW and WOHRC have made specific suggestions which are available from WOHRC. Labelling would, of course, assist the cosmetologist in making these choices.

Methylene Chloride: OSHA Guide and Toxicology Data



A set of guidelines on health hazards and methods for controlling methylene chloride were issued in March by OSHA as its response to a request for a health hazard alert and emergency temporary standard from the United Auto Workers and six other unions. The UAW cited recent National Toxicology Program (NTP) data showing the chemical's carcinogenicity. (These data are the basis of proposed FDA banning of methylene chloride in aerosols. OSHA critics this as a more appropriate and stringent agency response.)

The following is among the information contained in the guidelines:

Metabolism: The body handles methylene chloride by at least two pathways. The first produces highly reactive intermediates, such as formaldehyde, known to interact with genetic material and proteins. The second pathway produces carbon monoxide and carbon dioxide. The carbon monoxide will bind to hemoglobin, forming carboxyhemoglobin, which can have serious effects on the heart and circulatory system. Levels 2 to 3 times those of a one pack per day smoker have been found after methylene chloride exposure.

Human Effects: No conclusive epidemiological data on human cancer is available, although some studies have been published. An excess risk for hypertensive heart disease was found among exposed Eastman Kodak workers. At high concentrations it is also irritating and has a narcotic effect.

Animal Studies: Several studies have established methylene chloride to be an animal carcinogen.

Likely Exposure Situations: Approximately 235,000 tons/yr produced. 25% is used in paint stripping operations. Women workers are likely to be exposed in the electronics industry where it is used in printed circuit board manufacture. These aerosol products contain methylene chloride: hair sprays, cleaners, room deodorants, herbicides and insecticides. Many female dominated occupations and women who work in the home will be exposed.

Control: Ventilation, both local and exhaust, and product substitution are the two best methods for eliminating exposure. Lower temperatures will reduce air concentrations.

A complete set of references on methylene chloride and copies of the FDA memoranda are available from WOHRC. Order form on page 5.

Workplace Reproductive Health: Still Fertile Debate

A state-of-the-art report entitled **Reproductive Hazards in the Workplace**, has been published by the Office of Technology Assessment, the analytical arm of the U.S. Congress for helping legislators anticipate and plan for the positive and negative impacts of technological changes. This report includes a series of options open to Congress for protecting the health of workers while also protecting their employment rights.

Male Hazards Noted

The report broadly defines reproductive hazards as agents that cause impairment in adults, male and female, and developmental impairment or death in the embryo/fetus or child. Other potential effects include infertility, impotence, menstrual irregularities, spontaneous abortion, as well as damage to related body organ systems. The effects on males is emphasized in the report.

The relative dearth of specific information on health hazards is noted: "What is known ... is far outweighed by what is unknown," a factor which results in no reliable estimates of the actual number of workers exposed to such hazards, their levels of exposure and the toxicity of the agents to which they are exposed, according to the OTA. Four specific agents are now regulated in part because of their known reproductive effects: ionizing radiation, lead, DBCP and ethylene oxide.

Uncertainty is Management Difficulty

One management difficulty is that many agents have only been studied for their effects in males, females or offspring, but not all three groups. This can lead to employment policies which effectively discriminate against one sex's rights. Further, the current regulatory and compensation systems have many inadequacies for dealing with the problems raised by reproductive hazards. For example, workers usually cannot seek redress for harm under most compensations systems.

(continued on p. 6)



Canada Eliminates Sex Differences in Atomic Code

The Canadian federal Atomic Energy Control Regulations were amended in 1985 to provide the same dose limits for both sexes, except during the time of declared pregnancy. Previously, Canadian codes established a more stringent standard for fertile females under certain exposure conditions. Such codes are still standard in most other countries, including the United States.

The amendment followed analyses by Canadian experts which showed that when actual industrial exposures, childbearing rates and genetic risks were taken into consideration, the risk for adverse outcomes in fertile female radiation workers were far lower than those risks among the general population. This is a result of both the relative low exposure rates and the low fertility rates among females.

Previous separate standards in Canada and elsewhere have often been based on the assumption that all fertile females are potentially pregnant and not on actual fertility experiences.

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OTA's Proposed Options

The OTA report has focussed in on six main areas to present Congressional options, including sex discrimination, aspects of regulation and compensation for job induced harm.

Options in Sex Discrimination

Option 1: Congress could maintain the status quo

Option 2: Congress could amend Title VII so as to prohibit FPPs [fetal protection policies] that apply only to women unless scientific evidence exists showing that there are no paternally mediated effects

Option 3: Congress could require that employers with unproven but suspected developmental hazards in their facilities fully inform workers and allow individual employees to decide whether or not to continue in jobs involving such exposures. Employees would then be responsible for the consequences of exposures to which they consented.

Suboption: Congress could allow workers to temporarily and voluntarily remove themselves from jobs involving exposure to suspected reproductive health hazards.

Option 4: Congress could amend Title VII to explicitly permit FPPs that treat male and female workers differently when scientific information supporting differential treatment is inconclusive.

Options in Regulation

Option 1: Congress could maintain the status quo.

Option 2: Congress could instruct the regulatory agencies to be more willing to assume that an exposure is dangerous when only a small number of studies suggest this.

Private Right of Action

Option 1: Congress could maintain the status quo.

Option 2: Congress could amend the OSH Act to grant employees the right to force OSHA to take action against employers who may be violating either an OSHA standard or the general duty clause.

Additional Relationships between OSHA and NIOSH

Option 1: Congress could maintain the current relationship between OSHA and NIOSH.

Option 2: Congress could join OSHA and NIOSH organizationally.

Option 3: Congress could give NIOSH the power to force OSHA to respond to NIOSH recommendations concerning reproductive and other occupational health hazards.

Emergency Temporary Standards [ETS]

Option 1: Congress could maintain the status quo.

Option 2: Congress could amend the "grave danger" language of the OSH Act.

Option 3: Congress could amend the OSH Act so that all that is required when an ETS is issued is notice of OSHA's reason for issuing the standard and access to the scientific data on which it relied.

Compensation for Job-Induced Reproductive Harm

Option 1: Congress could enact a Federal statute, or State legislatures could add specific provisions to State workers' compensation statutes to cover loss of reproductive and procreative functions even when nondisabling.

Option 2: A Federal statute could be enacted or State legislatures could amend their workers' compensation laws to provide workers with the right to pursue a tort remedy for injuries falling outside the workers' compensation law.

Option 3: Reproductive impairment could be carefully disaggregated into those suitable for the compensation system and those suitable for the tort system.

Copies of the OTA Report are available from the US Government Printing Office, Washington DC 20402. Stock No. 052-003-01001-1 for \$15.00 Summaries are available at no charge from OTA, Washington DC 20510.

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