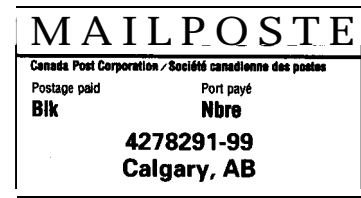
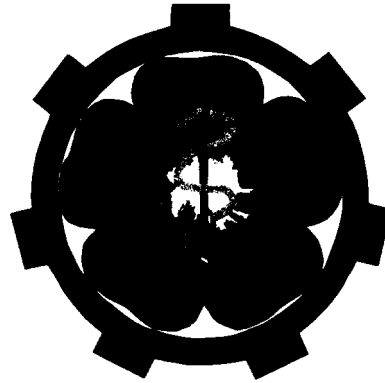


RETURN ADDRESS:

Editor, Alberta Occupational Medicine Newsletter
Dept. of Community Health Sciences
Faculty of Medicine
University of Calgary
3330 - Hospital Drive N.W.
Calgary, Alta., T2N 4N1 Canada



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FALL 1997

ALBERTA OCCUPATIONAL MEDICINE NEWSLETTER

EDITORIAL COMMENTS

A clinical problem not uncommonly faced by family physicians, obstetricians, and occupational physicians is that of chemical exposure during or preceding pregnancy. Based on his first year medicine research elective (MDCN 340) at The University of Calgary, Jason Caplan has prepared a short guideline to help the medical practitioner collect the necessary information, make a preliminary assessment of health risk, and provide rational medical and vocational recommendations. The goal of his elective was to write a starting document suitable for development into a formal guideline by a provincial or national multi-disciplinary group.

This issue of the newsletter also contains our annual update on the educational activities of the Occupational and Environmental Medical Association of Canada. In upcoming issues, we will provide details on the Association's new website, including a listing of Canadian post-graduate training opportunities in occupational health.

Kenneth Corbet, MD FRCPC
Editor

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FETOTOXIC CHEMICALS IN THE WORKPLACE: A Draft Guideline for Physicians

J. Caplan, BSc and K. Corbet, MD FRCPC*

Introduction

Concerns about the effects of workplace chemicals on the health of a developing fetus are likely to increase because:

- women in their childbearing years are a growing proportion of the workforce,
- women are shifting from service, administrative and health care sectors into fabrication, manufacturing, and technical areas, with greater potential for exposure to chemicals at work,
- new job opportunities are greatest in small to medium sized business, which are less likely to have effective programs for the identification and control of workplace hazards,
- the awareness of chemical hazards at work is increasing through legislated programs such as the Workplace Hazardous Materials Information System (WHMIS).

In the future, therefore, family physicians and obstetricians will more frequently be asked: "I work with chemicals, what is the risk to my baby?" or "I am thinking of becoming pregnant, is it safe considering what I've been exposed to?" Providing timely and wise counsel in these situations, however, is

a challenge for which most physicians are poorly prepared:

- the taking of an occupational or exposure history is not uniformly included in undergraduate medical curricula or residency training programs,
- the extent of exposure can be assessed only crudely from the patient's description of the work, and detailed on-site exposure measurements are rarely available,
- existing health-based exposure guidelines (such as Alberta's Occupational Exposure Limits) provide a good margin of safety for healthy males, but may not be protective of fetal health,
- toxicologic and epidemiologic information is generally lacking for fetal health effects, and cannot be applied directly to individual clinical situations.

Purpose, Scope, and Definitions

This draft guideline is intended as a discussion document for review and revision by a provincial or national multidisciplinary medical committee. The scope of this document is limited to occupational chemicals that pose a developmental hazard to the fetus, and will not address drugs (prescription or non-prescription) or hazards relating to fertility (reproductive hazards). It addresses asymptomatic patients with past or current occupational exposure to chemicals.

Prepared in the Department of Community Health Sciences, Faculty of Medicine
The University of Calgary, through funding by The Workers' Compensation Board - Alberta

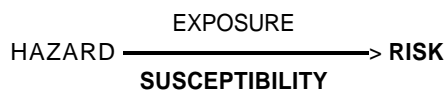
Developmental toxicity is defined as an adverse effect on the developing embryo or fetus that results from exposure to a chemical before conception (either parent), during prenatal development, or postnatally to the time of sexual maturation. In epidemiologic studies, measures of fetotoxicity can include: still birth, physical deformities or defects, developmental delays (cognitive and behavioral), perinatal mortality, pre-term delivery, low birth weight, and fetal loss.

Organogenesis occurs during the first twelve weeks of pregnancy and is the period in which the fetus is most sensitive to chemicals which cause birth defects. During the last six months of pregnancy, exposure to a harmful chemical can slow the growth of the fetus or affect brain development, but is less likely to cause birth defects. Babies of low birth weight have a greater chance of illness in the first year of life. Thus, both the type of chemical and the time period of exposure determine the nature of the toxic effect.

It is important to note the difference between exposure and absorption. Exposure refers to the presence of the toxicant in the occupational environment, whereas absorption refers to the toxicant entering to the worker's body. In the occupational setting, the usual routes of entry are by inhalation, dermal contact, and ingestion.

Gathering The Necessary Information

To assess the risk posed by exposure to chemicals, the physician must gather information on the health effects and potency of the chemical hazard, the intensity and duration of exposure, and the susceptibility of the mother and fetus.



The assessment begins by taking an obstetrical and medical history, including a personal and family history of pregnancies, birth defects, and developmental problems in offspring. Underlying medical conditions such as hypertension, seizure disorders, and other chronic diseases can impact on the pregnancy, as can smoking, alcohol consumption, therapeutic or illicit drugs, and other lifestyle and behavioral factors.

The physician should next take an occupational and exposure history

(Table 1). While most patients will have some knowledge of the chemicals in their work, additional information is usually necessary when providing clinical advice. Material Safety Data Sheets (MSDS) are required by provincial and federal regulations, should be readily available to the patient, and provide preliminary information on hazardous workplace chemicals:

- the key chemicals being used in the work process,
- the likelihood of inhalational absorption (high vapour pressure or used as a spray) and dermal absorption (splashes or other direct skin contact),
- what protective equipment should be used (goggles, mask, gloves, coveralls),

Table 1
Occupational and Exposure History

1. General description of the job or work process .
2. The chemical(s) that are used and how (sprayed, painted, splashed, etc.).
3. Intensity of exposure (ask about peak or unanticipated exposures, odour and irritant symptoms, and whether air concentrations have been measured).
4. Frequency and duration of exposure (number of times used per week, total hours per week).
5. Extent of protective measures (adequate ventilation, use of gloves or masks, housekeeping and personal hygiene).
6. Routes of absorption (inhalation, contact with skin or clothing, ingestion from eating or smoking with unwashed hands).
7. Paraoccupational exposure (laundering work clothes at home, other family members who work with chemicals).
8. Have there been adverse pregnancy outcomes in co-workers?

Having identified a specific chemical(s) or work process, library resources (electronic databases, textbooks, periodicals) can provide information that is more clinical relevant.. The MEDLINE database is familiar to most physicians; search terms (Mesh headings) that are most helpful for searches on this topic include

pregnancy or pregnancy complications, occupational exposure or occupational diseases, and the specific chemical or occupation of concern. More comprehensive databases (though not necessarily available at all medical libraries) are the Hazardous Substances Database, Toxline, Reprorisk (Micromedex), Biological Abstracts, and Chemical Abstracts.

In regards to specialized information services, the Alberta Poison and Drug Information Service (PADIS) commonly responds to calls from physicians regarding maternal and fetal health effects from drugs and chemicals (Calgary area 670-1 414; toll free 1-800-332-1414) . The Motherisk program (based at the Hospital for Sick Children in Toronto) can assist physicians calling from other provinces, providing the caller assumes long distance telephone charges (416 813-6780).

Medical and Vocational Management Options

Based the patient's history, the results from library searches and specialized information services, the physician should try to place the patient's workplace situation into one of three categories:

- exposure to the chemical (at usual levels in workplace) is probably safe,
- exposure to the chemical is probably harmful (proven fetotoxicity; especially hazardous if animal studies suggest that fetal effects occur at a lower exposure level than maternal health effects),
- uncertain or possible risk to the fetus (most chemicals will be in this category),

Depending on the degree of risk, options available to the physician will include patient counselling and advice, referral for clinical assessment, and workplace recommendation to the patient and their employer.

Patient Counselling and Advice

To begin, the physician should review with the patient the available chemical and health information, and categorize the risk as safe, harmful, or uncertain/possible. Exposure to a chemical of uncertain fetal toxicity are the most problematic of the three areas, and the advice of other health care specialists may be needed.

In addition to a risk classification of the chemicals, it is also important to

assess the level of anxiety of the woman - the perceived risk can, at times, exceed the actual risk. In extreme cases, it may be necessary to recommend a job transfer simply to alleviate anxiety even in the absence of toxicologic risk. In most cases, however, a competent initial assessment by the physician will help to reassure the patient. After receiving a pregnancy risk assessment, women were far less inclined to consider termination of their pregnancy. It is prudent, nonetheless, to remind the patient of the background rates of miscarriage, birth defects, and developmental problems during childhood.

Referral for Clinical Assessment

The expertise of obstetricians, pediatricians, geneticists, clinical toxicologists, or occupational medical specialists may be necessary for more complex cases. In the Calgary area, there is no single multidisciplinary consultation service for these clinical problems. Most obstetricians can provide a detailed fetal and maternal health assessment, including ultrasound to assess musculoskeletal defects and developmental milestones in utero, and amniocentesis to investigate any chromosomal abnormalities. Medical genetics departments at pediatric health centres can provide consultations on fetal health risk, but again will lack detailed information on intensity and duration of exposure. Interventions such as therapeutic abortion are rarely an option unless significant exposure to a proven fetotoxic hazard has occurred at a critical stage in pregnancy, or serious abnormalities have been identified on ultrasound or amniocentesis.

Letter of Concern to the Patient and Employer

Medical concerns are best communicated to a patient's employer by providing a letter to the patient for her to discuss with her employer. In all cases, letters should be limited to workplace recommendations, and not include specific diagnoses and medical details. The two most common recommendations to the employer are:

- reduce the patient's exposure to the chemical(s) - the employer should assess engineering controls (replace hazardous chemicals, prevent release of the chemical into the workplace, improve ventilation) personal protective equipment (proper selection, fitting, and use of masks,

gloves, goggles, and coveralls), and administrative options (job assignments and schedules, safe work practices, personal hygiene practices). This approach is most useful in cases where the chemical is of uncertain or possible toxicity, or where the patient has high level of concern.

- temporary removal from exposure to the chemical(s) - this restriction may be for a variable length of time depending on the situation (until further medical assessment, until usual maternity leave, or until breastfeeding is finished). This option is most useful for chemicals having stronger evidence of fetotoxicity. In many cases, an employer will be able to reassign the patient to alternate work, with no lost time or economic implications. In other cases, however, a medical leave of absence may be necessary, but the patient should be aware that eligibility for medical or unemployment benefits in these situations can be variable.

Summary

The management of developmental toxicity from workplace chemicals will be an increasingly common clinical challenge for physicians, but a challenge for which most are poorly prepared. Many cases can be managed through a detailed patient history and use of available information resources, other cases may require an obstetrical, toxicologic, genetic, or occupational medicine opinion. Proper management includes in all cases counselling the patient (and her spouse) about the level of risk, and may involve medical recommendations to the employer to reduce or eliminate exposure to the chemical.

For further information, the following are recommended references:

American College of Occupational and Environmental Medicine
"Reproductive Hazard Management Guidelines". *of Occupational and Environmental Medicine*, 38:83-90, 1996.

O'Brian J., Rossenwasser K. Counseling for Occupational Exposures and Reproductive risks. *Seminars in Perinatology*, 17:45-49, 1993.

Baird P., Reproductive Hazards and the Workplace. *Canadian Medical Association Journal*, 147:157-160, 1992.

Bentur Y., Koren G. The Three Most Common Occupational Exposures Reported by Pregnant Woman: An Update. *American Journal of Obstetrics and Gynaecology*, Vol. 165, No. 2,429-437, Aug. 1991.

*Faculty of Medicine, The University of Calgary, Calgary, Alberta

HIGHLIGHTS

Annual Scientific Conference Vancouver, 1997

Occupational and Environmental Medical Association of Canada

Dr. Ruth McIlrath and Dr. John Sehmer are to be congratulated for their timely and appropriate choice of topics for this year's scientific agenda. We have received many compliments on the quality of these sessions.

A wide range of topics provided a very practical review of common issues in occupational medicine. The sessions were well attended and stimulated lively discussion. The following are summaries of some of these sessions:

SHIFTWORK HEALTH AND AGING

Dr. Don Johnston, Medical Director of Nova Corporation Alberta, shed some new light on shift work and the experience in the petrochemical industry. The gradual decrease in restorative sleep of stages three and four in the working population may explain the difficulty older workers experience in recovering from a night shift compared to younger workers. Also, sleep apnea is more common in older shift workers.

In the NOVA study, the treatment of sleep apnea was responsible for improving shifts-related medical problems. Colin Shapiro's handbook of Working the Shift, a Self-Health Guide, was recommended for distribution amongst shift workers as a strategy for minimizing health effects of shift working.

(continued on Page 5)

OCCUPATIONAL AND ENVIRONMENTAL MEDICAL ASSOCIATION OF CANADA

1997 Membership Development Committee Report

Liaison Newsletter

Murray Flotre and Joel Anderson continue as co-editors for our newsletter. Despite ongoing difficulty obtaining articles from the membership, a number of good items have been published, and the newsletter continues to be a forum for upcoming events of interest to members.

Membership Survey

The 1997 Membership Survey was mailed to members in June 1997; by the end of August, 208 surveys had been returned. A preliminary report has been prepared for review by the Board. More detailed analysis is planned over the next several months including comparison with the 1993 Membership Survey and recent surveys of the Canadian Medical Association and Royal College of Physicians and Surgeons of Canada.

Dissemination of the survey results is proposed as follows:

1. publish a summary of hours of work, earnings and billing, and benefits in Liaison,
2. prepare a full report for the Board and membership by June 1998,
3. submit one or more articles for publication in a peer reviewed journal by June 1998,

On behalf of the Survey working group, the Executive, Board, and membership of OEMAC, our sincere thanks to Herta Fidler, Jocelyn Lockyer, and other staff of the Office of Continuing Medical Education, University of Calgary for their invaluable assistance in the development, distribution, and analysis of this survey.

Royal College Maintenance of Competence Program (MOCOMP)

This Royal College program helps specialists document both group and self-directed learning activities, and provides accreditation for group CME events. Despite promotional efforts on

the part of OEMAC and the Royal College, participation of OEMAC specialists remain low, with little 'CME planning' value from the annual summary of self-directed learning topics. Planning of our annual scientific conference, however, has benefitted from the MOCOMP program, and continuing attendance at the annual MOCOMP workshop is recommended. J. Dunham attended the May 1997 workshop; K. Corbet will continue as credit assessor for CME programs relating to occupational and environmental medicine in Canada.

Practice Guidelines in Occupational Medicine

K. Corbet attended the 3rd Canadian Medical Association Clinical Practice Guidelines Workshop held in Ottawa in November 1996; a summary report and recommendations were prepared for the Executive. The CMA has recently published the results of this workshop as "Implementing Clinical Practice Guidelines: A Handbook for Practitioners".

It was felt that OEMAC did not have the resources to develop de novo guidelines. Instead, the following strategies were felt to be more achievable and sustainable:

- encourage members to identify practice situations where a consensus statement would be of benefit, and support regional and local efforts to meet these needs,
- collaborate with other professional associations in the development and implementation of consensus documents,
- monitor, review and disseminate existing guidelines relevant to the practice of occupational medicine (e.g., website newsletter and workshops).

Other activities this past year relating to guidelines include:

- review and comments on the CMA Policy Statement "The Physician's Role in a Safe and Timely Return to Work After and Illness or Injury",
- correspondence with the Canadian Infectious Disease Society, College of Family Physicians of Canada, Atomic Energy Control Board, Canadian Physiotherapy Association, and CMA

Affiliated Societies Committee regarding potential areas of collaboration.

OEMAC Website

L. Jamieson has developed a draft 'table of contents' for the Website, and has obtained a number of cost proposals for development and support of this electronic resource.

It will be in both French and English, and will provide information on the objectives and activities of OEMAC, past issues of Liaison, current conferences, and links to other websites. We hope to 'launch' the website by early 1998.

Educational Strategies for Occupational Health in Undergraduate Medicine

C. Martin (resident in Occupational Medicine at the University of Alberta) expressed concern about the small numbers of applicants for the two RCPS training programs in Canada, and whether medical students were having sufficient exposure to occupational health prior to their application for post-graduate training programs. The Executive asked K. Corbet and G. Liss (Ontario EFPO Scholar) to put forward strategies for OEMAC's promotion of undergraduate teaching in occupational health. The two key strategies at present are:

- prepare a letter to the Associate Deans at each Canadian medical school outlining certification requirements, teaching materials and training opportunities, and practice opportunities in occupational medicine (based on the results of the 1997 Membership survey),
- serve as an external reviewer of the revised objectives in occupational and environmental medicine for the Medical Council of Canada.

Of note is that 52 of our members reported an average of 2.6 hours per week spent on teaching activities; we hope that several of these members can recruited as OEMAC's educational strategies are refined.

Respectfully Submitted,

K. Corbet, MD, FRCPC
Chair, Membership Development Committee

HIGHLIGHTS (*continued*)

DISABILITY and the WORKPLACE, ISSUES IN MANAGEMENT AND ASSESSMENT: A new model for disability management

Dr. David Brown, Medical Director of CIBC, presented a summary of the initiatives within CIBC to address the current failing model for disability management. What became clear in their surveying the potential factors for this failure, was that the employee-manager relationship impacted significantly on lost time, work satisfaction and stress. Dr. Brown outlined the new model centered around the employee-managerial relationship, demonstrating that if there is a healthy relationship between manager and employee, which is clearly supportive to the employee, then methods of reentry and adaptation of the injured/ill worker can be worked out

at the manager employee level. Only when the issues become more complicated, the involvement of other supports including, physicians, ergonomists, industrial hygienists, human resources, become involved. This format is gaining momentum can acceptance, and is likely to become the gold standard for employers in disability/illness management at the workplace.

DISABILITY INSURANCE: The Insurance Company's Perspective

How insurance companies adjudicate claims for disability insurance is not well understood by the average practitioner according to Dr. Anne Wallace, who does consulting work for a number of Insurance Companies. She emphasizes, however, that the process of adjudication is very systematic. She described elimination period and own occupation riders, and described in detail what the practising physician can do to assist the insurance company and their client in securing these claims.

Included in the advice was legible writing, with clinical details given with backup of hard core medical data, reports, etc. to support the clinical condition causing the disability.

She described situations where medical information was willfully withheld, and the drastic consequences. She went on to describe the claims management process emphasizing initial communication with the insured, and using other modalities to support the claim including investigations by nurse case managers, independent medical examinations, functional capacity evaluations, and inspection, surveillance reports (including video surveillance).

She concluded by emphasizing the importance of disability insurance to the fabric of the social net, and recommended its use with honesty and respect. Unfortunately there are abuses which cost all involved. Fraud on disability claims in the USA total about 10 billion dollars annually. Anti fraud activities serve to protect legitimate claimants.

<http://mir.med.ucalgary.ca/oemweb/>

SOUTHERN ALBERTA OCCUPATIONAL MEDICINE PAGE

This website provides a variety of earning resources in occupational medicine to assist undergraduate students medical residents, and practicing physicians in Alberta.

developed by

The Department of Community Health Sciences

The BACS learning Centre

**Faculty of Medicine
The University of Calgary**

with the support of a Medical Education Grant from

The Workers' Compensation Board Alberta

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- **Other Websites**

a selection of links to other websites of educational interest

- **Research and Epidemiology**

questionnaires and links to research resources

- **Undergraduate Education Teaching Modules**

exposure to blood and body fluids; WCB and return-to-work planning; occupational lung disease; fitness to drive.

Have a browse and send your comments to

blaikie@mir.med.ucalgary.ca

UPCOMING CONFERENCES

CANADA:

- **Work-Related Musculoskeletal Injuries: Repetitive Strain Injury**

(Sponsored by The University of Calgary, for family physicians, physiotherapists and chiropractors)

March 28, 1998

Foothills Hospital Auditorium
Calgary, Alberta

This conference will explore preventive, diagnostic, treatment and rehabilitative strategies for upper limbs, shoulder and neck injuries due to RSI. Lecture topics include; RSI Defined, Workman's Compensation Board Perspective on RSIs, Patho Mechanics of RSI: A Chiropractic Perspective, Pathophysiology of Tendon Overuse: A Basic Science Perspective, Ergonomic Issues, The Initial Assessment, Return to Work Planning: The Essentials. Workshops include; Ergonomics, Psychological Aspects of RSI, Injury Management of the Upper Quadrant, Common Nerve Entrapment Conditions, Return to Work Planning: Case Studies, Trigger Point Assessment and Management, Spinal Dysfunction and RSI: Osteopathic and Chiropractic Issues. Accredited by CACMS and ACCME. Eligible for 7 MAINPRO-MI Credits, MOCOMP credits will be available.

Contact:

The University of Calgary, Faculty of Medicine
Office of Continuing Medical Education
3330 Hospital Drive NW
Calgary, Alberta T2N 4N1
Phone: 403 220-4251 Fax: 403 270-2330

- **Medical-legal Aspects of Work Injuries - 4th International Congress**

June, 1999
Toronto, Canada

Contact:

Helen Heacock
Conference Director
Phone: (604) 822-2772
Fax: (604) 822-4992
Email: heacock@unixg.ubc.ca
<http://www.iwh.on.ca/1999.htm>

INTERNATIONAL:

- **The Tenth Conference of the International Society for Environmental**

(Epidemiology & The Eighth Conference of the International Society of Exposure Analysis)

August 15-19 1998

Boston, Massachusetts, USA

The Conference will include symposia on working with communities and interested organizations to define the specific aims of research, emerging issues related to environmental endocrine and signaling pathway disrupters, and the uses of exposure assessment and environmental epidemiology at the international, national, regional and local level.

Contact:

Carol Rougvie
ISEE/ISEA Conference 1998
JSI Research and Training Institute
44 Farnsworth Street
Boston, Ma, 0221 O-I 211 USA
Phone 617-482-9485 Fax 617-482-0617

- **PREMUS-ISEOH '98**

(3rd International Scientific Conference on Prevention of Work-Related Musculoskeletal Disorders & 13th International Symposium on Epidemiology in Occupational Health)

September 21 - 25 1998

Helsinki, Finland

Contact:

PREMUS-ISEOH'98 Joint Meeting
joint Meeting Secretariat, Ms. Mirja Kallio
Finnish Institute of Occupational Health
Topeliuksenkatu 41 a A
FIN-00250 Helsinki, Finland
Phone: Int.+358 9 47 471 Fax: Int.+358 9 4747 548
e-mail: Mirja.Kallio@occuphealth.fi
<https://www.occuphealth.fi/eng/project/premus>