EXPLORING THE CURRENT ROLE
OF OCCUPATIONAL HEALTH PHYSICIANS
IN BRITISH COLUMBIA
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We accept this thesis as conforming to
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ABSTRACT

The purpose of this study is to explore the current role of B.C. occupational health physicians. Four aspects of the role are studied: type of employment; relationships with allied professionals, management, labour, and government; type of tasks performed; professional education and clinical experience.

In the United States, Great Britain and Canada, trends in the practice of occupational medicine are reviewed. A history of occupational medicine is given. Prelacement and periodic medical examinations and the physician's role as teacher, counsellor, rehabilitation officer and researcher are discussed. Six cases of B.C. occupational health physicians working in seven companies were studied. A descriptive approach is used. Field interviews and observations of the six physicians practicing occupational medicine are informal and flexible in design. This design permits the physician freedom to express his opinions about the practice of occupational medicine in B.C.

Results of the study suggest a need to develop occupational health and safety services by a third party agency. The need for recognition by management and labour of the complementary roles of industrial hygienist and occupational physician is discussed. British Columbia has various government agencies with acts and regulations pertinent to occupational health and safety. The recommendation is made to investigate the development of a single occupational health and safety act for B.C.

A frequent task performed by physicians is the preplacement examination. The study recommends that a position paper be given by professional associations on the
appropriate role of the physician and nurse in the preplacement screening and examination.

Educational programs for the physician and allied occupational health professionals need to be developed. Professional recognition of occupational medicine by the Royal College of Physicians and Surgeons of Canada would enhance the professional status of the occupational health physician by colleagues, management and labour.
ACKNOWLEDGEMENTS

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GLOSSARY

(1) B.C. Occupational Health Physician:
Denote those B.C. physicians practising in companies either full-time or part time. Physicians employed by prisons and W.C.B. are excluded. The term B.C. Occupational Health Physician does not indicate the level of education or the specialty of the physician.

(2) Occupational Environmental Hazard or Stress:
May be chemical, physical, or biological. The hazards include gases, vapour, aerosols, dusts, chemicals, noise, vibrations, lighting, extremes of temperature and pressure, body movement, infectious diseases, and sanitation as related to the workplace, work processes and duties of the worker.

(3) Occupational Health:
"The promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; the prevention among workers of departure from health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health, the placing and maintenance of the worker in an occupational environment adapted to his physiological and sociological equipment and to summarize, the adaptation of work to man and each man to his job".

(4) Occupational or Industrial Hygiene:
Is the science concerned with recognition, evaluation and control of working environmental hazards which may cause illness, impaired health or significant discomfort and inefficiency among workers.

(5) Occupational Medicine:
The branch of medicine practised by physicians in industry. Occupational medicine concentrates on preventing disease associated with work or which affect the safety of the worker and his work group and the functional maintenance of the health of the worker.
(6) Qualified Occupational Health Staff:
Staff who have had formal training or education in occupational health services. This education would include a certificate, diploma or degree.
CHAPTER I

INTRODUCTION

A. BACKGROUND TO THE STUDY

In the summer of 1976, information was needed about occupational health services in Canada. The information needed could be used to plan services and develop policy in occupational health. In that year I prepared a situation report on occupational health in British Columbia (B.C.). The situation report was requested by the B.C. Health Manpower Working Group and the Federal/Provincial Health Manpower Committee. In the report were described four types of occupational health staff; nurses, physicians, industrial hygienists and audiometricians. The report showed that 218 registered physicians in British Columbia practiced in occupational health services in industry. The occupational health physicians varied in the number of hours per week they practiced. This variation in hours per week of occupational health practice of 218 British Columbia occupational health physicians is illustrated in Figure I. Most of the 218 physicians practiced in occupational health services part-time; 53% of the physicians practiced one to five hours per week and 36% of the physicians practiced six to thirty-four hours per week. 11% of the 218 British Columbia occupational health physicians practiced in occupational health services thirty-five hours per week or full-time.

Occupational health physicians are distributed throughout British Columbia. Figure II illustrates the distribution of the 218 occupational health
FIG. 2. THE NUMBER OF HOURS OF WORK/WEEK OF PRACTICE IN OCCUPATIONAL HEALTH SERVICES OF 218 BRITISH COLUMBIA, OCCUPATIONAL HEALTH PHYSICIAN, JULY 1976, REGROUPED INTO FOUR TIME GROUPS.
C. Regional Hospital Districts

East Kootenay
Central Kootenay
Kootenay Boundary
Okanagan-Similkameen
Columbia-Shuswap
North Okanagan
Central Okanagan
Thompson-Nicola
Cariboo
Squamish-Lillooet
Fraser-Cheam
Central Fraser Valley
Dewdney-Alouette
Greater Vancouver
Sunshine Coast
Powell River
Mount Waddington
Ocean Falls
Skeena-Queen Charlotte
Kitimat-Stikine
Bulkley-Nechako
Fraser-Fort George
Peace River-Liard
Stikine
Capital
Cowichan Valley
Nanaimo
Alberni-Clayquot
Comox-Strathcona
physicians by Regional Hospital Districts. Most of the B.C. occupational health physicians practiced in the Greater Vancouver and Capital Regional Hospital Districts. Roughly 60% of the B.C. population reside in these two hospital districts.

For physicians specific education in occupational medicine is at the post-graduate level. Special post-graduate education for the occupational health physician are degrees in occupational medicine and diplomas in public and industrial health. The diploma in public health emphasizes public health aspects of preventive medicine and the diploma in industrial health emphasizes aspects of environmental hazards and industrial disease in the workplace. Table I illustrates the special post-graduate education in occupational medicine of 218 British Columbia occupational health physicians. (2)

TABLE I
Post-Graduate Education in Occupational Medicine of 218 British Columbia Occupational Health Physicians, (1976) (2)

<table>
<thead>
<tr>
<th>Category of Physicians</th>
<th>Diploma in Industrial Health</th>
<th>Diploma in Public Health</th>
<th>M.Sc.</th>
<th>M.A.</th>
<th>Certified American Boards Occupational Medicine</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total physician population (218)</td>
<td>8</td>
<td>10</td>
<td>7</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Physicians 35 hrs/wk. (25)</td>
<td>7</td>
<td>5</td>
<td>0</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>
Few of the B.C. occupational health physicians working part-time have special post-graduate education in occupational medicine. Most of the B.C. occupational health physicians working full-time have diplomas in industrial or public health.

**STATEMENT OF THE PROBLEM**

The situation report left questions about the employment, education, clinical experience, and tasks of the occupational health physician. Some of the questions were:

1. In what types of industries does the occupational health physician practice?
2. Where is the physician located in the organizational structure of the company?
3. With what types of staff does the occupational health physician practice?
4. What are the tasks of B.C.'s occupational health physicians?
   a) Does the B.C. occupational health physician perform only those tasks legislated by acts and regulations?
   b) Do the tasks concentrate on treatment or preventive aspects of medicine?
   c) Does the occupational health physician's tasks include health education of the worker and monitoring of environmental hazards?
5. Does the range of tasks vary with the amount of time spent in occupational health services?
6. What are the educational qualifications and clinical experience of B.C.'s occupational health physicians?

To answer the above questions a study was proposed in March 1977. Since permission to send questionnaires to the 218 occupational health physicians could not be obtained from the B.C. College of Physicians and Surgeons. It was then
decided to conduct an intensive study of six occupational health physicians in industry.

PURPOSE OF THE STUDY

The purpose of the study is to explore the current role of British Columbia's occupational health physicians. Four aspects of the role of the occupational health physician are explored in the study:

a) Type of employment;
b) Relationships with allied professionals, management, labour and government;
c) Type of tasks performed;
d) Professional education and clinical experience;

Type of Employment

The occupational health physicians practice in various types of industries. The types of industries and number of companies where the six physicians practice are identified. The types of industries are classified using the Canada Dominion Bureau of Statistics, Standard Industrial Classification Manual 1970 (1). The number of workers and the rate of physicians per 1,000 employees in each company is calculated and compared with the standard rates recommended by Sweden and the United States. Physicians can be hired full-time or part-time and paid on a salary or a contract basis. This pattern of employment in the six physicians is explored.
Relationships With Allied Professionals, Management, Labour and Government

Occupational health programs require the skills of different professionals and auxiliary staff both within and external to the field of occupational health. Types of professional and auxiliary staff with whom the occupational health physician relates in the company and the nature of the relationship is described. Sources of industrial hygiene services for the company and how physicians use the services are described.

The physician’s position in the company organization is diagrammed. Physician’s opinions are expressed about their position in the organization and their relationship with management. The administrative tasks of physicians in large companies are listed.

Experience with management and the worker’s perception of the physician is discussed.

Legislation pertinent to occupational health practice in the seven companies is listed. Physicians input to the development of the W.C.B. industrial hygiene regulations and the redundancy of some legislation are noted.

Types of Tasks Performed

Occupational health program are directed at three dimensions; factors affecting the workers health, the effect of the factors on the workers health, and the correlation between these two dimensions. Factors affecting the
workers health may be in the workplace, lifestyle of the worker or an organism. The physician assesses the worker for disease and injury and the workplace for hazards. The extent of the tasks, and the methods used to perform them are explored. In the practice of occupational medicine prevention and treatment services are provided. The extent of these services by the physicians are described.

Professional Education and Clinical Experience

Described in this aspect of the study is the number of years of medical practice and occupational medical practice of the six physicians; type of post-graduate education appropriate for the practice of occupational medicine; professional memberships of the occupational health physicians.

DEVELOPMENT OF THE STUDY

The purpose of the study was accomplished by reviewing the literature on the trends in the practice of occupational medicine and by studying six cases of B.C. physicians practicing occupational medicine. In the past, Canadian trends in medical practice have developed from the trends in the United States and Great Britain. Thus, literature about trends in occupational health services was reviewed from the United States, Great Britain and Canada.

A descriptive approach is used in the study. For information about the practice of occupational medicine in B.C., six physicians practicing in seven companies were selected for study. The six physicians were selected because I
knew they practiced occupational medicine in or near Vancouver, B.C. and were willing to be studied.

Field interviews and observations were used to collect information in the six studies. The field interviews and observations were informal and flexible in design. This design permits the physicians freedom to express their opinions and give information about the practice of occupational medicine in B.C. Guidelines for use in the interviews were developed. The guidelines give some uniformity in the type of information collected in the six case studies. (Appendix A) Observations of the physician performing various types of tasks were selected by the physician and on my request. The physicians identified those allied professional and auxiliary staff with whom they worked and I could interview.

Anecdotal records are used to record the information. Information for each case is recorded under the four aspects of the study; type of employment, relationships with allied professionals, management, labour and government, type of tasks performed, and professional education and clinical experience. Opinions are also sought about the physicians perception of the future development of B.C. occupational health services. (Appendix D)

LIMITATIONS OF THE STUDY

Because of the paucity of cases, results cannot be generalized to the population of occupational health physicians. Most of the 218 occupational
health physicians in B.C. practice part-time in occupational medicine. The part-time physician is not proportionately represented in the sample. Again, this limits the generalization of the results to the population of B.C. occupational health physicians.
REFERENCES


CHAPTER TWO

DEVELOPMENT OF OCCUPATIONAL SERVICES IN CANADA

The provision of health services at a worker's place of employment began to develop in Canada and British Columbia in the mid 1880's. (6) Over the years the emphasis and purposes of these health services have altered with Canadian social changes, economic and industrial expansion, increased knowledge of occupational hazards and their resulting diseases and the availability of occupational health manpower and treatment services.

The foundation of Canadian occupational health services was laid between 1884 and 1915. An historical record of significant occupational health services in Canada is contained in Table II. In Canada in the mid 1880's, "work days were cruelly long - 10-12 hours, factories and workshops were unsafe, unsanitary, crowded; wages a mere pittance. Unemployment was rife". (6) But, the blackest chapter of all was child labour. Working at unguarded machines, workers maimed by loss of hand and eyes were labelled unemployable, and, "dismissed without compensation ... for an employer was responsible for injuries incurred by his employees". (6)

Workmen banded together to assist fellow-workers in bad times following accidents and during illness and to protest the unsafe working conditions and injustices to workers. Workers collectively protesting and lobbying government and management for better working conditions was the beginnnning of the trade union movement in Canada. Trade unions were legalized in Canada in 1872. (6) Continuous pressure on governments from unions brought about the first industrial Acts as follows:
<table>
<thead>
<tr>
<th>Year</th>
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<tr>
<td>1883</td>
<td>Order of St. John - initiated first aid courses</td>
</tr>
<tr>
<td>1884</td>
<td>Ontario Factory Act - first in Canada</td>
</tr>
<tr>
<td>1886</td>
<td>Ontario Employers' Liability Act - first in Canada</td>
</tr>
<tr>
<td>1887</td>
<td>B.C. Employers Liability Act</td>
</tr>
<tr>
<td>1890</td>
<td>Federal Department of Labour created under Conciliation Act</td>
</tr>
<tr>
<td>1914</td>
<td>Ontario Workmen's Compensation Act - first in Canada</td>
</tr>
<tr>
<td>1915</td>
<td>Ontario Workmen's Compensation Board Created</td>
</tr>
</tbody>
</table>
| 1915-17 | Industrial Safety Associations formed (Ontario)  
B.C. Workmen's Compensation Act |
| 1920 | Ontario Division of Industrial Hygiene - first in Canada |
| 1922 | B.C. Workmen's Compensation Board First-Aid Service & Training |
| 1928 | Formation of first professional society - Industrial Medical Association of the Province of Quebec |
| 1929 | Ontario launched pre-employment and annual examinations of miners |
| 1931 | B.C. Industrial First Aid Attendants Association |
| 1939 | Federal Government created Division of Industrial Hygiene |
| 1943 | University of Toronto established first Industrial Hygiene Training Program |
| 1944 | Initiation of Federal Occupational Health Nurse Consultant |
| 1945 | Commencement of Federal Civil Service Health Program |
| 1946 | B.C. Workers' Compensation Board established an Industrial Hygiene Department |
| 1947 | Ontario Workers' Compensation Board first to introduce "blanket clause" for Occupational Diseases |
| 1949 | Formation of Canadian Society of Safety Engineering (preceded by Ontario S.S.E.) |
1950 - Government Employees Compensation Act administratively consolidated into Federal Department of Labour

1958 - Creation of Federal Radiation Protective Division

1963 - B.C. Workers' Compensation Board starts Hearing Conservation in Industry

1968 - Canadian Labour Code proclaimed in effect

1972 - Established the Saskatchewan Occupational Health Act which consolidated occupational health activities in the Department of Labour

1973 - Formation of Canadian Council of Occupational Medicine

- Honourable Marc LaLonde publishes Document "New Perspectives on the Health Care of Canadians"
- First National Conference on Employee Physical Fitness
- First Occupational Health Nurses Diploma Program established at Grant McEven College in Alberta
- Accident Prevention and Compensation Branch of Labour Canada becomes Occupational Safety and Health Directorate
- First National Conference on Occupational Alcoholism and Drug Abuse
- Federal - Provincial Conference of Deputy Ministers of Health request a study and report on Occupational Health in Canada

1976 - First National Conference on Occupational Health (Sponsored by C.P.H.A.)
- Alberta and Manitoba pass Occupational Health and Safety Acts and centralize activities into Departments of Labour
- Science Council of Canada initiates "Policies and Poisons" Study (6 hazards)
- Asbestosis Working Group releases report
- Canadian Council of Occupational Medicine becomes an affiliate of the Canadian Medical Association

1978 - University of Toronto established the first graduate degree program in Occupational Health open to all professionals in Occupational Health

1979 - Canadian Centre of Occupational Health and Safety established in Hamilton, Ontario

1980 - Post-graduate certificate program in Occupational Health Nursing established at Douglas College in British Columbia
1) The Ontario Factory Act, 1884
2) The Ontario Employer Liability Act, 1886
3) Ontario Workmen's Compensation Act, 1915 (3, 6)

Each Act progressively improved the working conditions and lessened the injustices of workers. By 1914, all provinces except Prince Edward Island had passed Factory Acts. All these Acts provided for appointment of a factory inspector, and cleaner and safer working conditions; eg., heating, ventilation, control of dust and gases. (6) The Ontario Factory Act also "forbade the employment of juveniles ... restricted the hours of work and types of employment for women". (6) The Quebec Factory Act provided for medical inspection but this was not maintained. (6) The Employer Liability Act established the liability of employers to compensate workmen for industrial accidents. (6) Under this Act, workmen had to show negligence on the part of their employer before recovering compensation. To prove employer negligence was frequently a lengthy, difficult and costly legal procedure and few workers ever recovered compensation. (6, 9)

The Factory Acts were later replaced by Workmen's Compensation Acts. Such Acts eliminated the process of establishing negligence on the part of the employer by the employee and "provided for the payment of compensation, medical expenses and other benefits to workers disabled by accidents or occupational diseases". (6) Compensable industrial diseases were listed and defined by the Acts. (6, 9) In the British Columbia Workmen's Compensation Act of 1917, "the cost of compensation ... was paid by employers on a collective liability principle" and six industrial diseases were covered. (9) Ten Canadian provinces now have Workers' Compensation Acts.*

Footnote: *In 1975, the Workmen's Compensation Boards changed their name to Workers' Compensation Board. The change recognized the increase of women in the work force and the continued movement towards equal rights for women.
Workers' Compensation Legislation require "industries to contribute to a fund in accordance with its payroll and the amount of disablement experienced by all industries of that type within the province". (6) In 1947, the Ontario Workmen's Compensation Boards (W.C.B.) further protected the worker with a "blanket coverage". Blanket coverage means "compensation is payable to workmen for disability arising out of any disease which is peculiar to or characteristic of that particular industry in which they are employed". (3)

Following World War I, expansion of the activities of the Factory Acts lead to the emergence of Industrial Hygiene divisions in three provincial Departments of Health. (1920 - Ontario; 1936 - Quebec; 1937 - Manitoba) (6) The purposes of these divisions was to provide consultation services to the W.C.B., the Departments of Mines, Labour and Health, employers, physicians and Accident Prevention Associations. The early services of these divisions included recommendations for labelling toxic substances used in industry, medical examinations of workers in metal mines and in Ontario the reporting of occupational diseases. (6) Later, as the hazards to the industrial worker's health became more evident and new hazards became known, the divisions added laboratory services for the analysis of gases and fumes and recommended that Acts and Regulations under existing Acts be established to govern specific hazards. (6) Individual Acts and Regulations dealt with Silicosis, Air Pollution and Radiation.

In 1938, the Federal Government developed the Industrial Hygiene Division which functioned as co-ordinator of industrial hygiene activities in Canada. The division studied the effects of air contamination and industrial conditions on the health of workers and distributed information. During World War II the division established
health standards for workers employed on all government war contracts. (6) These standards supplemented those standards already established under Provincial Health and Factory Acts. In 1942, the Federal Government established a branch of the Industrial Hygiene Division in British Columbia which extended consultative services to the W.C.B. and to the Provincial Department of Labour which administered the Factory Act. In 1945, the Federal Government assisted Saskatchewan and Nova Scotia in establishing provincial Industrial Hygiene Divisions for major industries. Saskatchewan focused on agriculture and mining while Nova Scotia started with marine and mining. (6) Today in B.C., industrial hygiene surveillance and research is mainly done by the B.C. Worker's Compensation Board.

Concurrent to the industrial hygiene developments labour and management continued to lobby government for improved industrial working conditions. New regulations under the Factory Acts were recommended, a Code of Labour established and the services of Workers' Compensation Boards expanded. In 1942, the B.C.

Workers' Compensation Board opened a Vocational Rehabilitation Centre which assisted premanently disabled workers in returning to productive employment. At the close of the 1940's, a placement strategy had been added to the prevention and protection strategies of industrial health programs.

The emergence of Industrial Hygiene services federally and provincially, stressed the importance of industrial hygiene in preventive medicine, established the employment of physicians, nurses, chemists and industrial hygienists in industrial health services and expanded and diversified the total development of Industrial Health
Services in Canada. (6). In 1943 the University of Toronto responded to this expansion by establishing the first and to date the only diploma program in industrial health in Canada. The industrial health diploma program attempts to meet some of the growing need for education of occupational health physicians and industrial hygienists. The program has operated sporadically until the present.

In 1950, the World Health Organization - International Labour Organization (WHO-ILO) Committee relabelled Industrial Health, Occupational Health. (8) This relabelling changed the focus of services from where the employee worked (industry), to the nature of their work (occupation). The WHO-ILO issued a statement on the aims of occupational health:

"The promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; the prevention among workers of departure from health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health, the placing and maintenance of the worker in an Occupational environment adapted to his physiological and sociological equipment and to summarize, the adaptation of work to man and each man to his job." (2)

This statement goes beyond safety, first-aid, and compensatory aspects of Industrial Health and includes environmental, ergonomic, and psychosocial aspects of health in the workplace. The WHO-ILO statement on the aims of occupational health includes strategies of protection, promotion, prevention and placement. (2)

In 1957, the Canadian government developed a universal hospital insurance scheme under the Hospital Insurance and Diagnostic Services Act. Universal hospital insurance was followed by government medical insurance introduced in 1966 under the Medical Care Act. The government universal hospital and medical insurance reduced
the financial barrier to treatment services for most Canadians. The decade of the sixties saw the cost of treatment services rise with the increased costs of labour. Means to hold the line on rising costs of illness had to be examined and implemented. One such means was an examination of the underlying causes of morbidity and mortality in Canadians. Improvements in these rates could be made with improvements in the environment and the reduction of levels of risk imposed by individuals upon themselves. (8) This belief was the basis of "The New Perspective on Health Care for Canadians", a document published in 1974 by the Honourable Marc LaLonde, Federal Minister of Health. Recommendations in this document had a direct relationship to the development of occupational health programs.

Some of these recommendations follow:

(i) the strengthening of industrial and emergency health services, including the training of personnel;
(ii) the continued extension of the role of nurse practitioners ... in the reduction of environmental hazards and self-imposed risks;
(iii) the promotion of employer programs for employees with alcohol problems;
(iv) continued Federal support for the training of health professionals. (8)

As one result of this document, occupation health services gained new status in prevention and promotion strategies of the Canadian health care system. The Federal/Provincial Committees of Deputy Ministers, Environment and Manpower began to examine occupational health services in Canada in order to develop occupational health policies. In 1975, after the Federal/Provincial conference of Deputy Ministers of Health, the Honorable Robert McClelland, B.C.'s Minister of Health, announced the increased priority of occupational health within the organiza-
tion of health services in B.C. To plan occupational health services and to develop policy, information was required on the current status of B.C. services. In 1977, a study requested by the Federal/Provincial Health Manpower Committee was conducted on the situation of B.C. occupational health services.
REFERENCES


3. Ibid pp. 141-142.


In Canada, treatment and preventive services for non-occupational diseases and accidents are provided through a system of medical, hospital, community health and voluntary agencies. This system of services are financed by a system of government universal medical and hospital insurance, taxation and private funding. The medical and hospital insurance premiums are the responsibility of the individual. Many companies pay these insurance premiums wholly or in part as a benefit to their employees. A trend in union negotiations is to have the company pay all of the hospital and medical insurance premium for the employee. This trend transfers the responsibility for the payment of the insurance premiums from the individual to the company. Management then perceive that they are providing some health services to their employees through the payment of insured services and corporate taxation. For the prevention and treatment of occupational disease and accidents, services are added to the Canadian system of services for non-occupational diseases and accidents. The additional services are occupational health programs in industry, information and research on hazardous agents, industrial hygiene inspection, first aid, safety and vocational rehabilitation services. The occupational health services are legislated through a complex system of Federal, Provincial, and Workers' Compensation Acts and Regulations. Federal and Provincial Ministries of the Environment, Labour and Health, and Workers Compensation Boards carry out the services legislated in the Acts. The Canadian Centre for Occupational Health and Safety is developing an information and advisory service on occupational health. (5)
In Canada, the Workers' Compensation Boards (WCB) provide compensatable insurance to workers with occupational related diseases and accidents, vocational rehabilitation services, and standards for first-aid and safety on the job. The B.C. Workers' Compensation Board has the most ranging legislated services and standards of all the Workers' Compensation Boards in Canada. In the B.C. Workers' Compensation Board annual report of 1976, the following services are described; accident prevention, industrial hygiene, laboratory, industrial noise, safety research and training, first aid, rehabilitation and compensation. The services of the B.C. Workers' Compensation Board are funded by company levies according to company categorized levels of risk of accident and disease as set out in the Workers' Compensation Act 1975 Section 37. (48) Roughly 80% of workers in B.C. are covered by Workers' Compensation Act and Industrial Health and Safety Regulations. Other industries such as mining are covered by specific acts such as Mines Regulation Act and the Coal Mines Act. The B.C. legislation which covers B.C. industry is illustrated in Table III (25). In 1976, the Employers' Council of British Columbia, submitted a brief to P.S. Ross and Partners re the Study of The Management and Administration Practices of the Workers Compensation Board of British Columbia. In the brief, the Employers Council comments on the role of British Columbia's W.C.B. in Occupational Health and Safety.

"In our opinion, it is not desirable to combine in one body a major insurance function, and accident prevention and industrial health program, and far reaching powers of regulation and punishment. To do so is to provide an almost irresistible framework of temptation to make proper use of one function to support another activity. Unnecessary antagonism are aroused, and opportunities for constructive co-operation between labour, management, the Workers' Compensation Board, and the government are reduced." (14)
TABLE III: B.C. Government Agency Activities by Industrial Categories

<table>
<thead>
<tr>
<th>Activity</th>
<th>Agriculture</th>
<th>Fishing and Trapping</th>
<th>Forestry</th>
<th>Mines, Quarries and Oil Wells</th>
<th>Manufacturing</th>
<th>Trade and Finance</th>
<th>Construction</th>
<th>Transportation and Communication</th>
<th>Service</th>
<th>Public Administration</th>
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<td>Safety Inspection and Enforcement</td>
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**LEGEND**

- **Agency**
  - Labour
  - WCB
  - Mines
  - Health
  - Environment

- **Major supportive activities**

- **Areas of federal jurisdiction**
Subsequent to the Ross report little change was made in the scope of services of WCB. The B.C. Workers' Compensation Board continues to play a dominant role in the development and implementation of occupational health services in B.C.

CONCEPT OF OCCUPATIONAL HEALTH PROGRAMS

The goal of occupational health programs is to ensure a healthy and safe working environment. (3) To achieve this goal, the World Health Organization (WHO) proposes several objectives:

"(1) to identify and bring under control at the workplace all chemical, physical, mechanical, biological, and psychosocial agents that are known to be or suspected of being hazardous; (2) to ensure that the physical and mental demands imposed on people at work by their respective jobs are properly matched with their individual anatomical, physiological, and psychological capabilities, needs, and limitations; (3) to provide effective measures to protect those who are especially vulnerable to adverse working conditions and also to raise their level of resistance; (4) to discover and improve work situations that may contribute to the overall ill health of workers in order to ensure that the burden of general illness in different occupational groups is not increased over the community level; (5) to educate management and workpeople to fulfil their responsibilities relevant to health protection and promotion; (6) to carry out comprehensive in-plant health programmes dealing with man's total health, which will assist public health authorities to raise the level of community health. (44)"

Various companies provide programs to fulfill these objectives. (8) The program staff assess the factors that affect the workers' health, examine the health effects on individuals or groups of workers and link these two aspects of an occupational health program. (10) When all these services are provided, a complete occupational health program is in effect. The following diagram illustrates this concept of a comprehensive occupational health program.
OCCUPATIONAL HEALTH PROGRAMS

FACTORS AFFECTING WORKERS' HEALTH
(influences)

HEALTH EFFECTS ON WORKERS OR GROUPS OF WORKERS
(impact)

CONCEPT OF A COMPREHENSIVE OCCUPATIONAL HEALTH PROGRAM (5)

In an occupational health program both preventive and treatment services may be provided. The Canadian Medical Association (C.M.A.) booklet entitled "Guiding Principles for the provision of occupational health services" states the emphasis of occupational health services should be prevention. (8) The World Health Organization (W.H.O.) also believes the emphasis of occupational health programs should be preventive. However, the W.H.O. in 1973, observes this about the practice of occupational health:

"Current practices in occupational health, even in the most highly industrial countries, seldom meet the goals set forth above. In many instances the major emphasis is on the finding of cases of illness and providing the necessary medical care and true preventive medicine plays only a minor role, if any, in day to day operations... Indeed it is the practice of general medicine in industry and not the practice of industrial medicine per se that characterizes today's efforts." (45)

In 1978 Dr. Jan Dukstra, N.D.P. member of Ontario's provincial legislature and former health critic commented about the practice of occupational health in Ontario.
"In Ontario, occupational health is dominated by physicians and hence by medical approaches: crisis intervention and the treatment of disease. This approach has been curative rather than preventive and ignores the sources of ill health in the workplace itself." (11)

Possible reasons for this criticism are related to the unavailability of qualified occupational health physicians and industrial hygienists. These factors are discussed later in the thesis.

Factors which affect the workers health may be occupational and non-occupational in origin. Chisholm reports that in a Canadian analysis of sickness absence records and worker visits to an occupational health centre some 30% were due to occupational disease and accidents and 70% or more were due to non-occupational diseases and accidents. (27) Studies conducted in the states of Oregon and Washington by the National Institute of Occupational Safety and Health (NIOSH) had similar findings. (27)

Disease regardless of its origin (occupational or non-occupational) is a problem to the worker and management. Unless covered by sickness and accident benefits, disease and injury means a loss of wages to the worker. In cases of prolonged illness it can mean a loss in quality of social, recreational, family life, and the fulfillment that work brings to daily life. To the employer a worker's prolonged illness means a loss in productivity, increased costs in sick benefits and the added cost of retraining or replacing workers. Sickness and absence of workers can mean a loss in company profits.
The American Medical Association (A.M.A.) recommends that occupational health programs give priority to the prevention of occupational diseases and accidents and consider procedures for non-occupational diseases and accidents as 'elective' if time and staff permit. (3) Nevertheless, the prevention of non-occupational diseases and accidents are important to management because they cause the majority of time lost from work. This fact may contribute to the trend of company-operated fitness programs as part of a health benefits package for workers. These programs include treatment and early detection of workers with lifestyle problems. In 1974, the B.C. Ministry of Health established the first 'fitness' program for workers in Canada. The program, located in Victoria was for civil servants. Most of the civil servants had sedentary occupations. The June, 1979 issue of the Financial Post magazine, one of Canada's leading business magazines focused on this trend in Canadian business. The magazine reported that most of the programs were purchased from private 'Fitness' oriented companies. The trend is moving to other provinces.

The Financial Post Magazine reported that money was spent on fitness programs. Many programs are for the executive staff who recognized that the incidence of heart disease in the above 40 male is rampant, and that a fit worker is a more productive worker. The same article reported that a fitness program for workers will save companies money.

The Financial Post article suggested that some companies emphasize the prevention of non-occupational disease. If companies do not conduct preventive programs for occupational diseases then who will conduct these programs?
Occupational health programs are in various types of industries in Canada and British Columbia. The B.C. situation report on occupational health (1977) revealed that some physician and nursing services are provided in the following types of industries; manufacturing, transportation, communication and utilities, community business and personal services, and public administration and defense trade, finance, real estate and insurance. (28) It is unknown if physician and nursing services are provided in mining, agriculture, forestry, fishing and construction. B.C.'s major industries are resource industries! In British Columbia first-aid and safety services are provided in most industries covered by the WCB and other Acts e.g. Coal Mines Regulation Act.

In some companies, services may be provided for injuries and chronic illness, e.g. injections. These services are for the convenience of employer and employee alike as it saves time-lost from the job. (10, 27) Because of universal availability of medical and hospital treatment services the Federal and Provincial governments do not wish to expand treatment services to industry. (30)

**OCCUPATIONAL HEALTH STAFF AND TYPES OF EMPLOYMENT**

Historically, the development of occupational health staff began with auxiliary personnel such as factory inspectors, first-aiders and safety officers and a professional staff of doctors and nurses. Later, as technology advanced and knowledge increased about occupational diseases and accidents, other professional and auxiliary staff were added. Additional professional and auxiliary include; industrial hygiene engineers and technologists, dentists, safety engineers, audiologists, audio-metricians, industrial psychologists, chemists, ophthalmologists, podiatrists and physiotherapists. (23)
Today an occupational health program is staffed by many types of professional and auxiliary workers. The basic team is composed of factory inspectors, safety officers, first-aiders, nurses, physicians, industrial hygiene engineers and laboratory personnel. Other professional and auxiliary staff are added because of the incidence of a specific occupational disease, and the scope of a company program. (23, 44)

Sweden and the United States have standard rates for some types of occupational health staff. In Sweden a rate of .5 per 1,000 employees is a standard for physicians, nurses and industrial hygienists. (36) In the United States, N.I.O.S.H. (1973) recommended rates based on levels of qualification of the professional occupational health staff. N.I.O.S.H. recommends 30 core group of trained professionals for 100,000 employees. (38) For example, a core professional physician would have a Master's degree and be certified in occupational medicine by the American Boards of Preventive Medicine. N.I.O.S.H. further recommended a standard of 116 second tier professionals per 100,000 in the labour force. These second tier professionals possess post-graduate training in occupational health and safety at a lesser level than the core professional. The second tier physician would work on staff in an occupational health centre and have a diploma in industrial health.

Based on N.I.O.S.H. standards, Dr. Bette Stephenson, Ontario Minister of Labour (19) said that Canada has a rate of three core group trained occupational health professionals. She estimated that "Canada needs 106 health and safety professionals for every 100,000 people in the labour force. Research shows that our immediate need is for 750 occupational health and safety professionals; 100 physicians, 300 nurses, 100 hygienists and 250 safety engineers." (38)
In the B.C. situation report (1977) I estimated that current British Columbia rates/1,000 employees are; 0.26 industrial hygienists, .239 occupational health physicians, .205 occupational health nurses. To meet the Swedish standard; I estimated that B.C. required an additional 430 industrial hygienists, 237 physicians and 268 nurses. Given these facts, one can understand that some B.C. companies have difficulty in hiring qualified occupational health staff. The lack of qualified staff is a problem in the development of occupational health programs.

In large (more than 500 employees) and small (less than 500 employees) companies, the goal of occupational health programs is similar but the scope of programs differs. (28) Most large national and international companies in Canada provide comprehensive occupational health programs conducted by the basic occupational health team. (23, 30) Examples of Canadian companies are Shell of Canada, International Nickel and Bell Telephone Company. However, 85% to 90% of Canadian companies are small (30). The small companies have difficulty in financing a comprehensive occupational health program.

Small companies do not find it financially feasible to employ the occupational health staff on a full-time basis. Frequently, the only full-time member of staff is the occupational health nurse. (23) In the United States Tabershaw claims small companies cannot support adequate skilled assessments in the workplace. (39) A similar situation probably exists in small Canadian companies. Small companies with an occupational health program may only provide those occupational health services required by legislation: safety and first aid.
Providing comprehensive occupational health services to small industries is a major problem in all countries and requires special arrangements. A variety of models have been proposed and demonstrated in Sweden, Great Britain, United States and Canada. (13, 24, 30, 31) In these models occupational health services to small companies are provided by sharing a common occupational health service. (13, 24, 31) Services are obtained from health units, community health centers, private societies or individuals.

In 1945, in Great Britain, Dr. A. Austin Eagger, headed up a demonstration project that provided industrial health services to a group of small companies in the Slough area of England. (13) Initially management valued the service because emergency treatment services and medical examinations were provided. "The need for the investigation of the working environment was rarely appreciated." (13) To be successful, the project also developed the cooperation of physicians in general practice and in the hospital. Twenty-two years later, 384 companies with a total of 30,750 employees were members of the Slough service. Similar industrial health services have developed in other parts of England.

In 1954, in Kitchener, Ontario, Canada, a two year demonstration project of occupational health programs for a group of small companies was established. Dr. J.H. Smith comments on the outcome of the project:

"This service was partially supported by government funds. Six of the seven companies participating continued the service at the end of the project. At the present time (1978) only three companies have partial or complete programs. This was due, in my opinion, to the fact that the services were based largely on preventive medical services initially and the impact was never really felt by the industries concerned. I feel as long as we continue this limited approach, development of industrial health programs will be extremely slow." (37)
In Quebec, occupational medicine is perceived "as a branch of public health in as much as it deals with hazards and people at risk." (30) As a branch of public health, occupational health is part of Quebec's community health centers. (30)

In 1975, at the Red Deer Health Unit, Red Deer, Alberta, a demonstration program of occupational health services to small industries began. (31) In this project, 39 companies in the City of Red Deer were provided with services from a health unit base. Eight thousand five-hundred ninety-seven (8,597) workers ranging from one self-employed to a firm of 175 employees were provided occupational health services. Fees were not charged for services and treatment services were not provided. (4) The Medical Officer of Health gave direction and consultative services to the program and qualified occupational health nurses gave the following services: (4)

(a) preplacement screening;
(b) baseline health screening of current employees;
(c) audiometry, setting up of hearing conversation programs;
(d) health counselling;
(e) screening and collection of samples (lead, carbon monoxide);
(f) advice on special health risks;
(g) immunization programs.

These services, now expanded, are still being provided to small industries in the Red Deer Health Unit area.
Another difficulty in providing occupational health programs in small companies occurs in the agriculture industry with the migrant workers. (30) Migrant workers, a significant part of the labor force, have a higher incidence of occupational injuries and disease than native born workers doing similar jobs. Most migrant workers are immigrants. In addition to increased risk of injury and illness, migrant workers may bring tuberculosis and parasitic disease to a country. With these diseases the migrant worker becomes a public health problem. Therefore the solution of occupational health problems of migrant workers lies in solving the public health problems of migrant workers. Occupational health services for migrant workers could appropriately be organized by local health units. The health units could provide a continuity of services as the workers migrate and coordinate public and occupational health services to the migrant workers and their families. Health services to migrant workers could be more effective with language training, education and improved socio-economic conditions for the workers. (30)

G.H. Gilchrist, of the United Steelworkers of America lists some of the advantages of having employee occupational health needs serviced by a private group of doctors:

(i) "Medical opinions and judgements are seldom influenced by either management or unions;

(ii) There is normally ready access to other specialties;

(iii) Complete confidentiality of records can be assured;

(iv) If employees use this medical group for general family health services then his or her records are maintained in one location. This is ideal for research and maintains a composite health record. It further prevents duplication of procedures, tests, etc. (30)."
A composite health record system is practical in small company towns where the company may employ or subsidize the employment of the general practitioner.

Contracted occupational health services to small industries is observed in British Columbia. In 1972, two B.C. occupational health physicians attempted to contract occupational medical services to small industries in the Marpole area of Vancouver. The project was unsuccessful because physicians in the local area opposed the project. In some B.C. small industries, individual physicians, audio-metricians are contracted to provide specified occupational health services on a part-time basis. (28) The audio-metric services contracted are legislated by the Workers' Compensation Industrial Health and Safety Regulations (49).

Occupational health services in large Canadian industries are funded by company generated revenues. Some small Canadian industries also finance occupational health services out of company-generated revenues. The Red Deer Alberta health unit based services are directly funded by government. (4)

In the Foulkes Report (1974) of B.C., a model of funding services to a group of small companies was proposed. (24) Basic services such as pre-placement examinations, health education and some industrial hygiene, administrative and first-aid services could be funded equally to all member industries on a monthly per capita fee. Payments derived from insurance sources, (e.g. WCB, prepaid medical plans) would be applied to a reduction of these per capita costs. Additional services such as periodic health examinations would be funded as employee-motivated partial payment (subsidized by the company) or entirely as a company-sponsored programme. This model of funding occupational health services includes company and employee responsibility.
Some authors state that the sharing of an occupational health service by groups of small industries would not be possible without some type of government support; e.g. grants, tax incentives, cost sharing. (30)

In addressing the first Conference on Occupational Health in Canada, Dr. E. Mastromatteo stated:

"In Sweden, the government 'social security fund' provides half the cost of physician and nursing services and medical supplies on the basis that the services are 50% preventive and 50% treatment. In addition to the 50% subsidy in health costs, the small plant service is permitted to recover charges for treatment services. Some believe this approach is worth considering for Canada. (30)."

In the future it must be determined if occupational health services in companies should be financed by "the market place" or government. The method of funding services to both small and large companies should assure equity in financing services and stimulate the development of comprehensive occupational health programs.

Small and large companies may differ in the number and type of employment of occupational health staff. Physicians in large companies may be salaried and work full-time. They can practice in a company-based occupational health centre or in a "company town". In smaller companies, the physician may be salaried or contracted to work part-time. Where the physician is employed by a government agency, he can be salaried and practice or consult in occupational medicine to several small industries.

Not all of the occupational health staff are employed directly by the company. Factory inspectors and some industrial hygienists are directly employed by the government agencies and provide a policing service or services at the request of the
company. (28) In 1976, the B.C. Workers' Compensation Board employed twenty-six industrial hygienists to provide legislated annual industrial hygiene inspections and at the specific request of companies industrial hygiene services.

TASKS OF THE OCCUPATIONAL HEALTH PHYSICIAN

In the practice of occupational medicine, the physician performs tasks which assist in the achievement of goals and objectives of occupational health programs. The tasks pertain to the cause/effect relationship of disease and accidents, their prevention, control, and the treatment of illness and injury. (45) To determine the cause/effect relationship of disease in workers, and effective measures for the prevention and control of occupational hazards, the occupational health physician assesses the worker for disease and lifestyle health problems and the workplace for hazards.

ASSESSMENT OF THE WORKER

The physician assesses the workers health before and during employment. These assessments are labelled the preplacement or pre-employment and periodic medical examinations. For this study the term preplacement examination will be used.

Preplacement Health Examination

The preplacement health examination is given prior to the workers employment, early post-hire or after a prolonged illness or injury. Required by statute or company policy the preplacement health examination determines the workers degree of fitness
for employment. From it, proper job placement of the worker according to his mental and physical capacities are determined so that the worker can perform his job with an acceptable degree of efficiency and without endangering the health of himself or his fellow workers. (35) The preplacement health examination also identifies workers potentially vulnerable to certain exposures in the work environment. (15, 35) Examples are those with previous back complaints in occupations involving heavy lifting and those with chronic upper respiratory disease, especially smokers, in occupations which may expose them to poisonous gases.

The results of the preplacement examination provides baseline data on the workers health. The baseline measurements of the preplacement examination are later compared with the results from a workers' periodic health examination. Such comparision is used for the early detection of adverse effects on the workers health. (15, 22) These comparative measures are of great importance for workers in occupations classified "at risk" or vulnerable. "At risk" or vulnerable occupations are those occupations with known hazards to health eg. asbestos coal mining; working with inorganic lead to name a few.

On completion of the preplacement examination the the physician decides whether the worker is fit for the job, disease is present which requires treatment, or because of a disease or potential illness the worker needs to be kept under surveillance by the occupational health staff. Having decided if the worker is fit for the job the physician informs the worker and management of the decision. Following recommendations from the physician on the worker's fitness to work, management with other information on the qualifications of the worker, determines if the worker will be hired.
Workers with disease are counselled by the physician about the effect this disease, treated or untreated, will have on the worker's performance. The occupational health physician refers the worker to appropriate medical, health or social services for treatment or advises the worker to receive treatment from his family physician. The sharing of information between the occupational health physician and the workers' physician is considered confidential under the ethical practice of medicine. Workers with illness or potential illnesses are monitored periodically by the occupational health staff. This monitoring process may operate with an "at risk" registry.

In the preplacement examination, controversy has arisen over the constant use of a complete physical examination as the "best test" to indicate the degree of health of workers. Dr. Michaels, Faculty of Medicine University of Manitoba, advocates the abandonment of the complete history and physical examination to reduce the problem of irrelevant information. He states it this way:

"Pursuit of matters unrelated to patients complaint can reduce ... the time available for pertinent questioning and examinations. ... The problems created by attempting a complete history and thorough examination on each patient are not primarily problems of time and cannot ... be solved by training more doctors ... or using physician assistants. Irrelevant historical information remains irrelevant when obtained by questionnaire, computer or nurse and may divert attention away from pertinent factors." (29)

Michaels believes the complete history and physical examination should be replaced by a selective history and physical examination based on screening objectives and presenting symptoms of the client. (29) This approach to the physical examination would make the information more relevant and increase the efficiency of whoever takes the history; doctor, nurse, physician assistant, or computer.
Harte and Schussler believe the complete physical examination is the most expensive item in the cost of the preplacement examination. (22, 35) Most of the cost of the examination is due to the time used by the physician to conduct a complete physical examination. The physician is one of the highest paid of the occupational health professionals. Schussler further states that this high cost does not guarantee that the complete physical examination is the best procedure for all preplacement examinations. Michaels believes that other procedures such as blood, urinalysis, stress and pulmonary function tests may be better tests than the complete physical examination to determine whether the worker is fit for the occupation, or to establish baseline data for future comparison of the workers degree of health. Another problem of the preplacement examination which faces the physician and management, occurs in occupations with high turn-over rates of workers. In these situations the complete physical examination can become a routine and redundant task for physicians. Redundant tasks tend to lower motivation, and create the potential for errors. (12), (22) In the United States some occupational health physicians refuse to dispense with the complete physical examination because of contemporary, legal and government pressures and would even expand it. (27)

To shed more light on the controversy over the use of the complete medical examination, alternative means and effectiveness in conducting preplacement examinations were studied in a variety of industries in the United States and England. The industries were public administration, hospitals, and manufacturing. Factors such as cost, types of staff and method of assessment were examined to evaluate the most cost effective means of determining the health of workers. The American Medical Association's Council on Occupational Health has said:

"preplacement examinations are made for the express purpose of determining and recording the physical condition of the prospective worker and assignment to
a suitable job in which his disabilities, if any, will not affect his personal efficiency, safety, and health, nor the safety of others." (27)

Within this framework Schussler, Kaminer, Power and Pomper, in 1965 at International Business Machines (I.B.M.) in the United States, evaluated 2,947 routine preplacement examinations. The purpose of the study was to determine the contribution of the preplacement examination to a final diagnosis or work restriction of a prospective worker. Of the 2,947 preplacement medical examinations, 722 were evaluated retrospectively and 2,225 prospectively. Medical charts were reviewed and sections of the medical examination such as applicant history, test measurements, doctors examination and nurse observations were each credited with findings on the diagnosis and restriction of a prospective worker. The study found the medical examination is valuable in:

"... detecting findings not requiring restrictions, but which could serve as a good medical baseline for future periodic examinations or where early detection and treatment might prevent future disability ... ." (35)

When the occupation was not restricted, the medical examination could be conducted post-hire for the benefit and protection of both the employer and employee. Schussler et. al. showed:

"For those findings necessitating restrictions, history and test measurements run by a registered nurse or qualified technician were by far the most productive means of detection ... ." (35)

Schussler et al had recommendations for occupations with potential hazards:

"For those positions where physical or mental limitations could result in serious consequences to the applicant or his fellow worker, preplacement examinations are indicated irrespective of how frequently positive findings necessitating job
restrictions are uncovered. When, however, physical or mental limitations do not present a hazard, the experience presented here would indicate that a conventional preplacement examination is not essential for all applicants. For individuals under age 40 physical examinations could be on an exception basis, being performed pre-hire only on those with positive histories or findings on other sections of the examination. This approach would have eliminated the need for a physical examination by a physician prior to hire in approximately 50 to 70% of all applicants in this study while missing necessary restrictions in only 0.5% of the applicants. (35)

Vogels and Spikehard believe that "a careful history is worth 90% of the examination". (41) Based on this assumption they evaluated the use of a pre-employment questionnaire on 1,900 applicants. The questionnaire was completed by the job applicant and reviewed by a nurse. The workers classified as "doubtfuls" as to fitness for work, were referred to the workers family physician or the company physician for a physical examination. Results showed that the questionnaire should be used to determine employability but not to prevent disease. The use of the questionnaire relieved the physician from doing an irrelevant physical examination. (41) Vogels and Spikehard concluded that physical examinations were still necessary to evaluate questionable health problems and wondered whether the questionnaire could be used in strenuous work environments with similar results.

In 1973, Dr. J.D. Harte reported to the Society of Occupational Medicine (England) about a study staff medical assessments at Bedford Hospital, Bedford, England. (22) The study conducted from 1969-1972 studied the value and use of the medical examination and health questionnaire. (15) Full medical examinations were given to those at risk because of age or known disability, to those in vulnerable occupations such as student nurses, transport drivers, X-ray workers, catering staff and junior medical staff. The other employees received a mailed out medical
questionnaire and had a health interview by the occupational health nurse. The purpose of the questionnaire was to identify medical conditions known to the employee. From this information the workers' health should be determined. The questionnaire was not intended to diagnose unknown disease although occasionally this occurred.

To test the relative value of the questionnaire, health interview and medical examination procedures were completed independently for the vulnerable staff and the results analyzed and compared after the examination was completed. They found considerable similarity between information obtained from the medical examinations and information gained independently from the questionnaire.

At the same time as the Harte study, the British Civil Service modified their pre-employment screening procedure. (40) Thompson reported the medical examination by physicians was maintained for all personnel in positions categorized as vulnerable. The rest of the civil service received a mailed health questionnaire which the worker completed and returned each year. The questionnaires were reviewed by trained personnel, and the "doubtful" workers referred directly to physicians. The use of the questionnaire was acceptable to management since it significantly decreased the time to recruit the civil servants and lowered the cost of physician services. Thompson stated that the government had to consider offering employment to those people whose health prospects were impaired. A classification of employees called "health doubtfuls", was established. Benefits for these employees were instituted after satisfactory employment for a specified period of time. Workers with unsatisfactory performance were terminated.
Results of the four studies have implications for the type of instruments used in conducting pre-placement medical examinations, the tasks of occupational health physicians, and a means for employing the disabled. The four studies indicate that a health questionnaire, interview and specific tests can under specified conditions substitute for the complete medical examination for pre-employment. One condition is that the purpose of the examination is to detect worker-known medical conditions and the fitness of the worker for the job. The health questionnaire and interviews can screen-out those potential workers whose health is doubtful. The "doubtfuls" are then followed up by a medical examination to determine their fitness for the job and to detect disease. The questionnaire was not a good instrument for screening workers applying for "at risk" occupations and those workers at risk because of age or known disability. For these workers, the medical examination by a physician was the best instrument to detect fitness of the worker for the job.

In the British Civil Service study, a policy and means of classifying fitness for the job permitted the employment of the workers who previously may have been rejected because of disability. (40) This approach illustrates an important aspect of "vocational rehabilitation" or a method by which the disabled can be employed, while meeting the goals of management; employment of workers fit for the job.

Periodic Medical Examination

The periodic medical examination is given during the workers employment with a company. The World Health Organization lists five purposes of the periodic medical
examination:

"i. to detect early impairment of health.
ii. to evaluate the effectiveness of preventive measures.
iii. to detect workers showing undue susceptibility to a particular environmental exposure.
iv. to reveal trends in the health status of groups of workers.
v. to indicate the need for medical treatment." (45)

The World Health Organization describes the limitations of the periodic medical examination:

"It should be noted that periodic health evaluations will never be adequate to prevent acute intoxications in the case of sudden high exposure. They serve mainly to prevent adverse effects of chronic exposure. However, if there is a long latency period between exposure and ultimate response (e.g., in the case of malignancy and tumors) and if no reversible early indicators are known, periodic surveillance will be of no avail." (46)

Periodic examinations may be required by statute or they may be voluntary. (34) Traditionally, most examinations required by statute are for occupations with known toxic hazards. The statutes specify the type of tests and frequency of administration for a specific hazard. One example is the organic lead regulation in the B.C. Workers Compensation Industrial Health and Safety Regulations (1980) Section 78.17. In other sections of the W.C.B. Industrial Health and Safety regulations e.g., Silica and Asbestosis, the tests are required infrequently. In these situations, the occupational health physician practices the art of occupational medicine by knowing the duration and dose of exposure to the worker and the general health of the worker. Indicators for the latter can be type of illness, the frequency of absenteeism from work and if the worker smokes. The occupational health physician may determine the frequency of the periodic health examination for a worker. Based on information about the company's environmental hazard, the occupational health physician may recommend a
company policy of a more frequent periodic examination than required by statute. Other acts and regulations which have standards for conducting periodic examinations are the B.C. Coal Mines Regulation Act and B.C. Industrial Transport Act. The B.C. occupational health physician must be familiar with the requirements of the Acts but most important the occupational hazards in the company.

Some companies develop their own policies for conducting periodic medical examinations. The Canada Federal Civil Service (1974) have established procedures for conducting Periodic Health Screening for workers. (9) The procedures are illustrated in Appendix F. The three screening procedures range from a health questionnaire completed by an employee and screened by a nurse to a health questionnaire followed by a complete clinical history and physical examination by a physician. The frequency and method of screening is applied to designated occupations. The standards are contained in the Canada Treasury Board Occupational Health and Safety; policies, standards, guides. (9)

Following the periodic medical examination, the occupational health physician records results of the examination for future epidemiological investigation, standard setting, work place adjustment, and sick benefit claims. (45) In interpreting the results to worker and management the physician is provided with the opportunity for health education regarding both specific and general risks of the work environment. (45) Health education may be directed at the individual worker, groups of workers, management or all of these people. In cases where the health of the worker is impaired, the occupational health physician then informs the worker and recommends treatment from the worker's physician. The management or line
supervisor is notified and the worker with impaired health may be moved to another job in the company. The company is also evaluated and assessed for causes of the hazard and the management and workers are informed. Preventive and protective measures are instituted or evaluated.

Physician, management and the worker attitudes about the benefits of the preplacement and periodic medical examination differ. The physician perceives the preplacement examination as a point when the health needs of the individual can be assessed and an opportunity for health education. (22) The management perceives the preplacement examination as a means of screening workers whom they wish to hire. Management may want the physician's advice on selection and placement, and a means of establishing data that will protect them from statutory liability. (22) Management also wants the examinations conducted at low cost.

As stated earlier in the thesis, management pays B.C. medical insurance premiums wholly or in part. B.C. Medical insurance covers the cost of a complete physical examination for an individual, except for occupational preplacement and periodic medical examinations. The cost of these examinations comes from the general revenues of the company. Therefore, management does not want to pay twice for a complete physical examination; once by medical insurance premiums and also by general revenues. (18) The company's aim is to have healthy employees and to do this at a low cost.

Workers may be ambivalent in their feelings about the periodic medical examination. Workers may fear the preplacement examination. (22) A worker may
view the examination as being conducted not for his benefit but, for management's. He may insist that the preplacement medical examination is unnecessary and a threat to his employment. J.D. Harte, in his study at Bedford Hospital, found the questionnaire sent from the occupational health department marked "confidential" less threatening to the employee than the questionnaire sent from the employer. (22) In other circumstances, he may welcome the monitoring for early detection of health impairment particularly in places of employment where the lack of prevention and control of toxic hazards is evident. On the other hand, the worker may fear loss of employment if illness is detected.

The occupational health physician has a role in assisting management and the employee in their perceived goals. In his role the occupational health physician does not arbitrate between management and the worker. Tabershaw gives this code of behaviour for the occupational health physician:

"The comfortable thing for the physician to do is to avoid making any decision regarding risk in the work environment and simply throw the problem back limiting his diagnosis to a description of the physical and mental impairment, if any exist." (39)

The occupational health physician is obligated to inform management and the worker of the risks in the work environment. Once they are informed, the physician must accept the decision regarding who and under what circumstances a man may work. (39)
ASSESSMENT OF THE WORKPLACE

In addition to the assessment of the worker's, assessment of the work environment is an important component of a comprehensive occupational health program. An environmental assessment measures the factors in the worker's environment that are hazardous to the worker's health. Results of the environmental assessment coordinated with the results of the health of the worker, may indicate to the physician the cause/effect relationship of disease.

To assess the environmental hazards in an occupation extensive use is made of instruments. The selection of samples, their frequency and duration is an important aspect of the assessment. The information gathered aids in identifying hazards and implementing preventive, protective or controlling measures to reduce them. An expert in the field of environmental assessment is the industrial hygienist. The industrial hygienist is a scientist trained to recognize, evaluate and control health hazards in the working environment, particularly the chemical and physical agents which can induce injurious effects in man. The industrial hygienist is trained initially in one field such as chemistry, engineering, physics, biology and medicine. He acquires by experience and post-graduate education a knowledge of other allied disciplines. The industrial hygienist suggests to the physician areas of danger or dangerous tasks within the plant. With this information the physician can correlate the worker's illness and complaints with known health hazards of the occupation. From this the physician will know what health effects to monitor in the worker, the type of biological tests to order, prevention to initiate and treatment services to refer.
In the United States large companies use industrial hygiene teams composed of chemists, physicists, engineers, toxicologists and physicians. Some small companies employ a single industrial hygienist while other small companies cannot afford to employ an industrial hygienist. In 1976, twenty-six industrial hygienists were employed by the B.C. Workers Compensation Board and three industrial hygienists were employed by private industry. (28) Mr. Al Reigert of B.C. Workers Compensation Board estimated in 1975, that fifty industrial hygienists were required for British Columbia.

The World Health Organization states:

"As the team approach by physicians and industrial hygienists is rarely practiced, it is difficult to relate the conditions of ill health to environmental factors at work. Thus, it is not possible to evaluate the effectiveness of environmental control measures. The main causes of these serious limitations are lack of awareness by health planners of the need for occupational health practice and a shortage of trained occupational health personnel." (45)

In small companies, the physician is frequently the professional responsible for assessing the workplace environment for hazards and co-relating this information with the health condition of the worker. (30) Where the cause/effect relationship of disease and exposure rates is known, the physician can accomplish this task by a simple technique. The physician uses standardized morbidity and mortality rate to identify the effects on workers of various occupations and their environment. This simple technique has met with success in many instances and at low cost. Whether this technique leads to the employment of more occupational health physicians is unknown. The technique is not applicable in situations of new hazards where the response relationship are not fully known.
Health and Welfare Canada (1977) estimates that each year 200 new health problems arise associated with the work environment. (25) To diminish these as yet unknown hazards, occupational health physicians and industrial hygienists are required. The lack of a physician and industrial hygienist to co-relate the assessment of the worker and the workpace will limit the success of prevention, and control of occupational hazards and protection of the worker. Thus the objectives of a comprehensive occupational health program cannot be achieved.

PHYSICIAN AS TEACHER, COUNSELLOR,
REHABILITATION OFFICER AND RESEARCHER

Illness in workers can be prevented by control of environmental hazards in the workplace, by changing the individual behaviour of people at work and by a combination of these two approaches. (30) Change in behaviour takes place by reinforced education, and peer pressure. Occupational health physicians and other members of the occupational health team are in strategic positions to change the behaviour of people at work by giving information to both workers and management.

Felton states that in the United States occupational health physicians are responsible under the law (Occupational Health and Safety Act, 1970) for the education and training of employers and employees in their recognition, avoidance and prevention of unsafe or unhealthy working conditions. (16) The physician can educate workers and management by explaining the risk of contact with toxic substances, advice on precautionary practices and a review of the system of clinical and environmental study. (16)
Various methods of giving information are used by the physician. The methods are counselling, individual and group education, information bulletins, reports and committee meetings. (16)

The physician may be a teacher or counsellor in "life-style" problems of workers and management. These life-style problems can include alcohol, tobacco, sedentary lifestyle, and nutrition. (22) Some of these life-style problems can have a synergistic effect with environmental hazards in the workplace. An example of this is smoking and asbestos workers. Alcohol abuse is a frequent cause of illness absenteeism and productivity loss in industry. The physician can be involved in establishing an alcohol counselling program at the plant site with the aid of supervisory staff, management, fellow workers and trained professional and lay staff. Some life-style programs are promoted in industry by private agencies and public health programs.

After an illness or injury that may or may not be work related, the worker is assessed for fitness to return to work. Where the worker is unfit to return to his former occupation or could return to his former occupation with job modification, the physician may act the role of vocational rehabilitationist. In this role the physician will work with union, management and the worker. He may recommend the worker for job retaining or modification to the worker's job task or occupational environment that will allow the worker to return to his job. The occupational health physician may also recommend to management and to the worker that he (the worker) return to his job on an incremental basis according to his work tolerance. To fulfill this recommendation, the occupational health physician may consult with the worker's physician, specialists, family members, line managers, personnel officers and unions. In some cases, it may
be appropriate for the occupational health physician to encourage a worker with chronic illness to retire and maximize his remaining years. (16) The physician may also assist the worker to seek appropriate resources in solving health and social problems in his family and family life. (16, 21). The occupational health physician does this through liaison and consultation with community social service agencies and the worker's personal physician. (16, 21)

RELATIONSHIPS BETWEEN OCCUPATIONAL HEALTH PHYSICIAN, COMPANY STAFF AND ALLIED PROFESSIONALS

In organizations, the basis of a relationship between employer and employee is established at the time of hiring. For occupational health programs large companies directly hire full-time physicians to practice occupational medicine as a part of an occupational health team. The physician is paid a salary and is an employee of the company. (30) Occupational health physicians directly hired by management may be biased in his loyalty to the company and management policies. This can occur when the occupational health physician hired is a friend of management. (21) Physicians are also hired by companies to practise in "Company Towns" providing primary and occupational medicine to the employees of the company eg. at Stewart and Hudson Hope. In smaller companies the physician frequently practices occupational medicine part-time and is hired on a contract basis directly by the company or by a 'third party agency'. An example of the latter would be Red Deer Health Unit project where the third party agency is the health unit. (31) In companies who hire the physician 'by third party, the physician is at arms length from the company thus minimizing some of the occupational health physician's biase. Tabershaw comments that physicians and
management often interrelate socially because of their similar socio-economic status. (37) This association may bias the physician's perception of workers, a bias which may not be readily recognized by the occupational health physician.

Management can have difficulty in hiring physicians with experience and education in occupational medicine. (21) This problem exists more frequently in small companies than larger companies. Larger companies tend to attract the specialist in occupational medicine. Smaller companies hire general practitioners in their area who are interested in occupational medicine, or whom management knows (ie. retired or a friend). The general practitioner hired may know little about the objectives of an occupational health program and the type of occupations in the industry. He may tend then to practice general medicine in industry. Some physicians are hired by management to be responsible for executives from the upper ranks of management to the President, whereas other physicians are responsible for the full labour force (21)

Management may not distinguish between the various bodies of medical knowledge and therefore anticipate that the physician "knows it all". (21) Management's inability to distinguish the qualifications of physicians will affect the scope of services and quality of the occupational health program in the company.

The B.C. Workers' Compensation Board, Industrial Health and Safety Regulations effective January 1978, Section 78.01 (d) defines the occupational health physician as;

"a physician in good standing with the College of Physicians and Surgeons of B.C. who undertakes the responsibilities of practicing preventive medicine in industry for an occupational group."
The above legislation does not specify the education for an occupational health physician. In the future, with the development of Canadian education facilities for occupational medicine, management will be better supplied with specialists in occupational health. Large companies, research and government agencies will benefit most from this development. Management and physicians in smaller companies will have to demand that education courses to meet their needs be provided. An emerging trend is that younger physicians entering the field of occupational medicine do so as their choice of medical practice. Because it is their choice they may be motivated to seek and demand education in occupational medicine. (21)

In the practice of occupational medicine, areas of conflict between the ethical practice of medicine, labour and management's perceived rights and responsibilities can arise (21). One area of dispute can be the confidentiality of the patient/doctor relationship and records. Dr. Bob Martin of Dofasco Company, Hamilton, Ontario, tells about it:

"at first, there was a continuing battle with management to protect the confidentiality of patient/doctor relationship. Furious personnel or industrial relations people demanded the right to read some of the files. They were refused" (21).

Similar situations are reported by physicians in companies such as B.C. Telephone, Imperial Oil and Ontario Hydro. One way to resolve this conflict is to have the physician put his job on the line the first time it happens and every other time after that. (21) In this way management and labour learn the role of the physician regarding the ethical practice of medicine and the relationship between the physician and the worker.
Another area of conflict between physician/management relationships, can be management's expectation that the physician will act as a truant officer of frequently absent employees, and as a means for management to push into early retirement "undesirable" employees. Dr. Jack Dunne in Toronto describes what often happens:

"No one wants to fire anyone. They want the doctor to do the dirty work. I have to send back a report that says 'There is nothing medically wrong with this man. If he's simply not doing his job then you (management) fire him'". (21)

Workers may also perceive the occupational health physician as being 'in the pay of management', and question whether he can trust the doctor with his confidences. (21)

Areas of conflict between the physician, management and labour are alleviated by various methods. Management and labour relations personnel must know and respect the ethical practice of medicine, worker and doctor relationships and the confidentiality of medical records of the workers. The quality control of work done by physicians is the joint responsibility of the College of Physicians and Surgeons and the B.C. Medical Association and should be recognized by labour and management. Management has and should accept the responsibility of the general overseeing of occupational health and safety in the company. In addition to management's response workers should have a full commitment and participation in occupational health services. (22) Workers feel that if they are to accept their responsibility, they should be able to participate fully in assessing hazards and making their workplace a safe one. Participation by labour and management in deciding on safety and health matters can be achieved by establishing joint labour/management occupational health and safety committees, in industry. (22) In some countries and Canadian provinces these
committees are prescribed by law thus insuring that neither labour nor management dominates occupational health services. (22) In British Columbia the W.C.B. Industrial Health and Safety Regulations, (1980) Section 4:04 (1)(b) on industrial health and safety committees states:

"...In no case shall the employers representatives outnumber those of the workers ...". (49)

Further details on the composition of the committees and their functions are contained in Appendix E. An industrial health and safety committee can be effective in companies with a participative management style, but may produce conflict in a company with authoritative management style.

Occupational health physicians inform and educate management, workers, and labour relations personnel about hazards of occupations in the company and their effect on workers. (22) In B.C., the relationship between management and workers and physicians is defined in W.C.B. Industrial Health and Safety regulation section 78.05.

"The occupational health physician is responsible for advising examined workers as to the nature of the occupational health hazards for which the examination is carried out and to the health precaution required." (49)

Section 78.05 further states:

"Whenever a medical examination reveals that: a worker is likely to be peculiarly susceptible to an industrial disease, or a worker has already developed the early signs or symptoms of an industrial disease, then the occupational physician shall undertake such other medical investigations as he may deem necessary and shall advise the worker and employer of preventive or remedial actions necessary in the circumstances." (49)
At the Canadian Public Health Association first conference on Occupational Health, Dr. John F. Finklea Director of National Institute of Occupational Safety and Health, U.S. Department of Health raised the problem of proprietary information. Dr. Finklea stated:

"We must however resolve the dilemma in our country of getting industry to release the information that is necessary to protect the public's health and the health of the worker without undue infringement on proprietary information. In many industries, what you know that can keep you one or two years ahead of your competitors is your margin of existence and there is legitimate concern on the part of industry of the misuse of proprietary information." (30)

In the United States and Canada, the physician's position as administrator has been questioned. Because of the claimed shortage of physicians and the rising costs of medical services, it is argued that physicians can be more effectively employed in direct patient care and not in administration. (16) Dr. J.S. Felton, Chief of Occupational Health Service, Naval Regional Medical Center, California, states,

"Until such time as the lay person can assume the responsibility legally, ethically and morally, the accountability for the health status of the organization is that of the physician. He still is the one staff person "looked to by management for guidance on matters of worker health, and acts with them in the interpretation of the organizational goal of the maintenance and improvement of human resources." (16)

William Carr has similar remarks to Felton on the physicians leadership role in occupational health;

"if the problems of occupational health in general and environmental hazards in particular are to be solved, we must work together and take guidance in cohesive, coordinated central sources headed by properly trained people ... There is no more logical person than the well trained occupational health physician." (30)
Management designates the physician as leader of the occupational health team by his position in the company; Director of Occupational Health Services. In this position the physician's opinion on occupational health matters is sought out by management or brought to management's attention by the physician. Ideally, informed decisions can then be made by management on the means to diminish the risk to workers of occupational hazards. The physician is also responsible for coordinating and directing the company's occupational health team and formulating policies and procedures on occupational health.

To coordinate and direct the expanding number of occupational health team members, Allan Gregg in his book *Challenges to Contemporary Medicine* advises student and interns to learn the essentials of management. (20)

In some part of the United States, public health services are employing trained health administrators who do not necessarily have a medical qualification but may have a health or social service background. (26) The same trend is beginning in Canada. Dr. Gerry Bonham, Assistant Deputy Minister, Community Health Programs in B.C.'s Ministry of Health in October, 1979 at the Senior Staff Meeting of Provincial Community Health stated,

"Health District Directors in the future, may no longer be a physician but a person with training in health care planning and administration."

This statement reflects the move away from the medical to an administrative model. If a change is taking place from the medical to an administrative model in other areas of the preventive health care system, perhaps the same trend may take place in the
organization of occupational health services. Regardless of who is to head the occupational health division, "The organization must report at a management level high enough to assure that top company management is fully informed of all significant occupational health activities, problems and concerns so that appropriate action can be taken where necessary to assure a safe and healthful workplace." (3)

In the practice of occupational medicine, relationships between the occupational health, primary, and community health preventive physicians are important. The Canadian Medical Association (CMA) states that occupational health services are "one aspect of the overall preventive or public health program in the community." (8) The Association suggests that occupational health programs and physicians should exist in the delivery of preventive health services as a part of community health programs. The C.M.A. also recognizes that the function of occupational medicine is an important part of the system of preventive medicine, but "the practice of occupational medicine should not encroach on the field of private medical practice. Therefore, the role of occupational health physicians interrelates with the primary care and public health physicians in the provision of a comprehensive system of preventive medical services to the Canadian public."
The following diagram illustrates this concept:

A System of Preventive Medical Services to the Canadian Public

Clive Dennis, Executive Director of Prairie Institute of Environmental Health states:

"Co-operation with and involvement of primary (family) and specialty physicians from the surrounding area is considered essential to an occupational health programs". (30)

Sir Richard Doll reports that 80% of occupational cancers are brought to light through the observations of family physicians. (30) Therefore, in the planning of occupational health programs the primary care physician must be included. One way is by direct communication between the occupational health physician and primary
physician. For example: The primary care physician observing an increased incidence of disease may question its relation to occupations in his community and report these observations to the appropriate occupational health physician. Collectively, the physicians can investigate the cause of illness and take measures to relieve those causes, thus ensuring the practice of preventive medicine in their community. (30)

For workers assessed with illness or social problems, the occupational health physician will refer them to the workers physician for treatment. This information is treated in a confidential manner. Co-operation between the occupational health physician and the primary physician is essential. Together they can diminish the health effects of occupational illness and accidents, and other health and social problems of the worker and his family which may affect the safety and work performance of the worker and his co-workers. However, Dr. J.D. Harte (Occupational Health Department, Bedford General Hospital, Bedford, England) has these comments to make about the attitude and experience of the general practitioner and the occupational health employment medical examinations:

"Few general practitioners, however, have experience in employment medical examinations and many resist and even resent such a relationship for their patients. They know little about the demands made by work upon the patient and tend to think of work as either heavy or light as seen through the eyes of the patient." (22)

The attitude of the general practitioner can limit the effective practice of both the occupational health physician and the general practitioner. Dr. Bette Stephenson
addressing Canadian family physicians reminds that them:

"Each physician must recognize that the medical problem of the patient he or she is treating may be occupationally related and must identify the nature of the patient's work. At the present time most of the physicians know the patient's place of employment ...... the place of work is of less importance than the nature of the work." (38)

Accidents and hazards that occur in a person's leisure life or home life can increase the number of man days loss at work. Thus, the provision of preventive health services must not only be at the work site, but also in the community.

From 1970 to 1971, Project FACTS (First-Aid Community Training for Safety) was conducted jointly by Ontario Workers' Compensation Board and St. John Ambulance. (1) The aim of FACTS was to study relationship between first-aid training, accident rates and attitudes to safety in industry and in the community. The results of the study indicated that first-aid training of employees, combined with an effective safety program significantly reduces industrial accidents by 20 to 30 percent.

Following the project, St. John Ambulance designed a safety-oriented first-aid training program (SOFA). Algoma Steel Mill in Sault Ste. Marie instituted the SOFA program.

"Benefits of SOFA program are not restricted to the employee on the job, but rather spill over into the community. The employee carries his knowledge of first-aid and his accident awareness with him in his off-the-job activities, whether they be hunting, fishing, sports, boating, other recreational activities or doing the odd job around the house. It has been proven that for every accident that occurs on the job approximately seven occur off the job, so the importance of such a program to our employees'
family life is easily recognized. Therefore SOFA should not mean fewer interruptions on the job site but should also mean greater safety from injuries for employees and families." (2) As of 1979, the SOFA program has been instituted in 130 B.C. companies.

A good occupational health program provides benefits to both management and employee. The employee gains by increased quality of life, at home, leisure and work, and reduced financial problems due to illness. Management gains by decreased absenteeism and off-the-job time seeking medical attention, for minor and emergency illnesses and increased productivity of workers. The cost of disability claims and W.C.B. are saved in premiums. For both worker and management the span of working years increases. (24) Although not evident at the inception of a programme, most or all the these benefits tend to accrue with time. (24) The physician has an important role in relation to management and employees in achieving the benefits of a comprehensive occupational health program.

EDUCATION OF OCCUPATIONAL HEALTH PHYSICIANS

One problem in the future development of occupational health services in Canada and B.C., is the provision of occupational health staff with the necessary training, qualifications and industrial experience. (19, 24) The majority of occupational health personnel are untrained. In 1975, Greenhill and May estimated 85% of trained workers in this field received their training outside of Canada; many in the United States and Great Britain. (19) Canada is relying on other countries such as the United States and Great Britain to train her occupational health physicians. Since demand for trained occupational health physicians is increasing, neither country will be able to meet Canada's needs. Canada must, therefore, supply and train her own occupational health personnel including physicians.
Great Britain has developed an educational model for occupational medicine, based on the level of the physicians’ practice. (34) The education model is aimed at the undergraduate, non-specialist and specialist in occupational medicine. For the undergraduate level, the joint ILO-WHO Committee on Occupational Health recommends at least twelve hours of formal instruction in occupational medicine. (34) This ILO-WHO recommendation is practiced in Great Britain. In Great Britain, the non-specialist in occupational medicine is the full-time physician in a subordinate post or the part-time general practitioner who provides services to small companies. For these physicians, diplomas or short term training courses should include basic principles of occupational medicine. The content could be presented at week-end courses and seminars. The aim of specialist training is to prepare the physician to take the responsibilities of Directors or Senior Medical Officers in occupational health services, in government departments and, as consultants or teachers. Training programs for specialists include courses in occupational medicine with supervised practice in occupational health services, teaching, and research departments. For these specialists a Master of Science Degree in occupational medicine is given at the London School of Tropical Medicine and Hygiene.

The United States offers post-graduate diploma programs and degree programs in occupational medicine also. In 1955, the American Board of Preventive Medicine was the first to recognize occupational medicine as a registered specialty. (34) In the first ten years, 300 physicians were certified through examination. Other registered specialists related to occupational health are also recognized in the United States, e.g.: Preventive Medicine and Aviation Medicine.
Canada has developed diploma and degree programs related to occupational medicine. For 35 years a diploma program in Industrial Health at the University of Toronto has been the only course available in Canada to physicians working in occupational health. (19)

In the 1970's, the demand for training in occupational medicine increased in Canada, the United States, and Great Britain. Therefore, Canada had to provide educational programs in occupational medicine at a more accelerated rate than in the past. In 1978, two M.H.Sc. programs in occupational and environmental health commenced at the Universities of Toronto and McMaster (Appendix B). These programs open to a variety of professionals including physicians, provide an opportunity for a multi-disciplinary approach to learning that can be carried over into the practice of occupational health. These M.H.Sc. programs are similar to the programs offered at the specialist level in Great Britain.

The M.H.Sc. at Toronto will partially meet the requirements for a Fellowship in Community Medicine. In 1936, occupational medicine was recognized as a sub-specialty of Internal Medicine. (33) Therefore, some Canadian occupational health physicians have obtained a specialty in Internal Medicine. Currently, the Royal College of Physicians and Surgeons of Canada is debating whether occupational medicine should be recognized as a separate specialty or as part of the Fellowship in either Community or Internal Medicine. (26, 32) To date there is no official Fellowship or registered clinical Specialty in occupational medicine in Canada. (26, 32)
In Canada, diploma and degree courses to educate physicians in occupational medicine are available in Eastern Canada. As resource development is accelerating in the Western provinces, the demand for qualified occupational health personnel including physicians will increase. Greenhill and May recommend that a training program for occupational health physicians in the western provinces be considered. (19)

In British Columbia, the University of British Columbia, community colleges, the Workers' Compensation Board, professional associations and B.C. Government Health Manpower Committee have been approached to provide educational programs for occupational health professionals. The Weeks Report (1972) states:

"The medical and nursing professions express strongly positive views on the need for the early establishment of a teaching program in occupational health at the University of British Columbia." (42)

Short introductory and continuing education programs in occupational medicine and nursing were proposed. (42)

In Foulks' Report 1974, briefs presented by Dr. David Chisholm and Dr. Linton Kulak said there was a lack of Canadian postgraduate programs in the field of occupational medicine and occupational health nursing. Chisholm and Kulak recommended that the B.C. Government develop educational programs for occupational health professionals and commented that interest and involvement in such programs could be sought from the University of British Columbia, Simon Fraser University, British Columbia Research Council, Workers' Compensation Board and other health care organizations and industries. (24)
In the same year and again in 1976, Mr. A. Reigert, Director of the Industrial Hygiene Division of B.C. Workers' Compensation Board approached the University of British Columbia and Douglas College to establish an education program for occupational health nurses, physicians and industrial hygienists. (28, 47) The occupational health nurse interest group of the Registered Nurses Association of British Columbia (R.N.A.B.C.) pursued this issue for their profession. In 1979, the B.C. Health Manpower Committee approved the development of a post-basic occupational health nursing certificate program at Douglas College. This course, which commenced in the fall of 1980, is the first B.C. education program for an occupational health professional. (17)

As in other parts of Canada, short-term training and continuing education programs for physicians and other occupational health professionals are sporadically available in workshops and seminars. In British Columbia these are provided by professional associations such as the Canadian Medical Association (C.M.A.), Registered Nurses Association of B.C. (R.N.A.B.C.), Workers' Compensation Board, and the B.C. Safety Council. Post-graduate and continuing education programs are available in Ontario and the United States but, difficulties of time and expense limit the number of physicians who can attend these programs.
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CHAPTER FOUR

DESIGN AND METHODOLOGY

From monitoring the incidence of occupational disease, research and analysis of the cause/effect relationship of occupational diseases, the promotion of healthy lifestyles, and control of environmental hazards has resulted the increased demand for occupational health professionals. In Canada, knowledge of the numbers, qualifications and employment of occupational health professionals has been scarce. Included in the group of occupational health professionals are occupational health physicians. To plan British Columbia's needs, information is required on the employment, tasks performed, education and clinical experience of B.C. occupational health physicians.

QUESTIONS

Several questions about the practice of B.C. occupational health physicians are asked:

1. In what types of industries does the occupational health physician practice?
2. Where is the physician located in the organizational structure of the company?
3. With what types of personnel does the occupational health physician practice?
4. What are the tasks of B.C.'s occupational health physicians?
   a. Does the B.C. occupational health physician perform only those tasks legislated by acts and regulations?
   b. Do the tasks concentrate on treatment or preventive aspects of medicine?
   c. Does the occupational health physician's tasks include health education of the worker and monitoring of environmental hazards?
5. Does the range of tasks vary with the amount of time spent in occupational health services?

6. What are the educational qualifications and clinical experience of B.C.'s occupational health physicians?

PURPOSE OF THE STUDY

The purpose of the study is to explore the current role of B.C. occupational health physicians. Such information can best be used in planning for the training and use of occupational health physicians.

To answer the above questions, four aspects of the role of the occupational health physician are explored in the study:

a. Type of employment;
b. Relationships with allied professionals, management, labour, and government;
c. Type of tasks performed;
d. Professional education and clinical experience.

DESIGN OF THE STUDY

The purpose of the study was accomplished by examining the literature on the trends in practice of occupational medicine, and by case studies of current practicing B.C. occupational health physicians.

In the past, Canadian trends in medical practice have developed from trends in medical practice in the United States and Great Britain. Thus, literature was
reviewed from the United States, Great Britain and Canada. An intensive study was made of six B.C. occupational health physicians. A descriptive approach was used in the case studies. Interviews and field observations were used to collect information about the six cases. The field interviews and observations were informal and flexible in design. This design permitted the physicians freedom to express their opinions and give information about the practice of occupational medicine in B.C.

Guidelines for use in the interviews were developed from the questions asked about the B.C. practice of occupational medicine. The guidelines gave some uniformity in the type of information collected in the six case studies (Appendix A). The physicians selected allied professionals and auxiliary staff with whom they worked and whom I could interview.

SELECTION OF THE STUDY GROUP

1. Through previous contact with the B.C. Government Occupational Health Service and the R.N.A.B.C. Occupational Health Nurse Interest Group, I knew of a few physicians who worked full-time or part-time in occupational medicine.

2. Six occupational health physicians were contacted by letter to participate in the study (Appendix C₁ and C₂). They were selected because they practiced in or near Vancouver and were willing to be studied. A group practice of physicians practising occupational medicine in several small industries declined to participate in the study because the physicians were on vacation. Four occupational health physicians agreed to be studied. Two of these physicians directed one of their staff physicians to also participate in the study. Therefore, six occupa-
tional health physicians were participants; four in charge of occupational health centers and two staff physicians.

LIMITATIONS OF THE STUDY

The number of cases studied were few. Because of the few cases, results can not be extrapolated to the population of 218 B.C. occupational health physicians. Most of the 218 B.C. occupational health physicians practice part-time in occupational medicine. The part-time physicians are not proportionately represented in the sample. Again, this limits the generalization of the results.

METHOD OF OBSERVATION

1. Over a period of five weeks two to three days were spent with each physician in observing and interviewing them regarding their activities in occupational medicine. Observations and interviews were conducted at the company where the physician practiced occupational medicine. An informal interview was conducted with each physician. Guidelines to the interview are contained in Appendix A.

2. Professional qualifications about the six physicians were obtained from the Canadian Medical Directory 1977 (2).

3. Other occupational health staff were interviewed. These staff identified by the occupational health physician were:
a) two industrial first aid attendants
b) three occupational health nurses
c) one employee assistance counsellor
d) one company manager

4. On request, the occupational health physicians supplied written reports about their occupational health centres. These reports included:

a) Anonymous case studies of employee health problems.
b) Policies and procedures of the occupational health centers.
c) Written communication between labour and management on occupational health matters.
d) A proposal for an occupational health center for small industries in an industrial park.
e) Charts, records and forms.
f) Annual reports.
g) One occupational health physician volunteered and kept a daily log of his activities for three days.

METHOD OF DATA ANALYSIS

1. Field observations, reports and interviews were recorded for each physician's case study under the four aspects of the study. (See Appendix D.)

2. The six physicians in the study were grouped into three categories:

a) directors
b) staff physicians

c) consultants in occupational medicine

The groups were labelled by the physician's job title in the company. Using these categories, each physician's professional qualifications and tasks in occupational health programs were listed.

3. The six occupational health physicians in the study practiced in seven companies. The seven companies were classified into industries according to Canadian Dominion Bureau of Statistics, the Standard Industrial Classification Manual, 1970 (1). The seven companies were grouped by size; small (less than 500 employees) and large (greater than 500 employees). The classifications and size of company were used to describe two aspects of the study; the type of employment and relationships with allied professionals, management, labour and government.

4. Using information from the literature review and from the six case studies the future role of the occupational health physicians, was explored.

5. Recommendations and areas for future study of occupational health physicians, allied personnel and occupational health programs were indicated.
REFERENCES


2. CANADA MEDICAL SERVICES DIRECTORY, 1977.
CHAPTER V

RESULTS

Of the six occupational health physicians studied, two physicians have staff positions; two physicians are labelled Consultants in occupational medicine; two physicians are each labelled Director of Occupational Health, and Director of Employee Health Service.

For purposes of this study the physicians are grouped and labelled as follows:

<table>
<thead>
<tr>
<th>Label</th>
<th>No. of Hours in Occupational Medical Practice Per Week</th>
<th>Position Held</th>
</tr>
</thead>
<tbody>
<tr>
<td>Director A</td>
<td>35 Hours</td>
<td>Director of Occupational Health</td>
</tr>
<tr>
<td>Director B</td>
<td>35 Hours</td>
<td>Director of Employee Health Service</td>
</tr>
<tr>
<td>Staff C</td>
<td>35 Hours</td>
<td>Works with Director A</td>
</tr>
<tr>
<td>Staff D</td>
<td>35 Hours</td>
<td>Works with Director B</td>
</tr>
<tr>
<td>Consultant E</td>
<td>10-12 Hours</td>
<td>Consultant in Occupational Medicine</td>
</tr>
<tr>
<td>Consultant F</td>
<td>29 Hours</td>
<td>Consultant in Occupational Medicine</td>
</tr>
</tbody>
</table>

The two staff physicians and two Directors practice occupational medicine full-time or 35 hours per week. Both consultants in occupational medicine practice part-time; one practices 12-15 hours per week, the other 29 hours per week.
TYPE OF EMPLOYMENT

The six physicians practice in seven industries. Five physicians practice in single large companies. The two staff physicians and two Directors work in two companies headquartered in the Greater Vancouver area. Consultant E practices in four small companies in the Greater Vancouver area, scattered within a 20-mile radius of his general practice. Consultant F practices in a single-industry town in the interior of the province. All physicians in the study have general practitioners and specialists practicing near the company they serve.

The six physicians are hired by company management. The four full-time physicians are salaried; the two part-time consultants in occupational medicine are hired on a contract basis.

The companies in which the physicians practice are in four types of industries. Table IV illustrates the type of industry, number of companies and number of company employees where the occupational health physicians practice. The staff physicians are excluded because they practice in the same companies as the Directors.

Director A provides services to employees in a variety of industries: public administration, personal services and construction. Since the majority of employees work in the public administration industry this classification is used. The number of employees recorded includes only those employees in the public administration industry. Director A does not know the total number of employees in personal services and construction. The number of employees in personal services and construction in the public sector was not readily separated from the number in the private sector. Therefore, only the number of employees in Public Administration are recorded.
TABLE IV

Type of industries*, number of companies, and number of employees where four British Columbia Occupational Health Physicians Practise. (1977)

<table>
<thead>
<tr>
<th>Category of Physician</th>
<th>Type* of Industry</th>
<th>Number of Companies</th>
<th>Number of Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Director A</td>
<td>Public Administration</td>
<td>Many</td>
<td>58,000</td>
</tr>
<tr>
<td>Director B</td>
<td>Transportation Communication and Utilities</td>
<td>1</td>
<td>13,000</td>
</tr>
<tr>
<td>Consultant E</td>
<td>Manufacturing</td>
<td>4</td>
<td>540</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(a)</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(b)</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(c)</td>
<td>150</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(d)</td>
<td>250</td>
</tr>
<tr>
<td>Consultant F</td>
<td>Manufacturing and Mining</td>
<td>1</td>
<td>4,500</td>
</tr>
</tbody>
</table>

The rate of occupational health physicians per 1,000 workers in the seven companies is illustrated in Table V.

### TABLE V

Rate of occupational health physicians per 1,000 workers in seven B.C. companies by type of industry (1977).

<table>
<thead>
<tr>
<th>TYPE OF INDUSTRY</th>
<th>Total Number of Employees</th>
<th>Total Number of Physicians</th>
<th>Rate of Physicians</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Administration</td>
<td>58,000</td>
<td>4</td>
<td>0.07</td>
</tr>
<tr>
<td>Transportation, Communication and Utilities</td>
<td>13,000</td>
<td>2</td>
<td>0.15</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>540</td>
<td>1</td>
<td>1.85</td>
</tr>
<tr>
<td>Manufacturing and Mining</td>
<td>4500</td>
<td>3</td>
<td>0.66</td>
</tr>
<tr>
<td>Total</td>
<td>76,040</td>
<td>10</td>
<td>0.13</td>
</tr>
</tbody>
</table>

The rate of occupational health physicians is highest in the small companies.

The rate of physicians in the manufacturing and the mining/manufacturing companies is greater than the standards recommended in Sweden (rate of 0.5) and N.I.O.S.H. The rate of physicians in the Public Administration and Transport companies are less than the standards recommended by Sweden and N.I.O.S.H.
In the two large companies of Public Administration and Transportation, Communication and Utilities, the workers were located at the headquarter offices in Vancouver and Victoria, and scattered in other areas throughout the province of British Columbia. For these companies, the system of providing occupational medical services to workers outside the Vancouver area differs.

Director A, who works in the Public Administration industry has sub-offices and referral centres located where large groups of employees work and where employees working in adjacent areas can travel. The sub-offices are located in Victoria, Kamloops and New Westminster. The referral centres are located in Prince George and Nelson.

Director A has three staff physicians. Two staff physicians and Director A are located in the Vancouver office. One staff physician is located in Victoria. All of the four physicians practise occupational medicine in their respective offices and provide itinerant occupational medical services to the other sub-offices and referral centres. The occupational health physicians have regularly scheduled services to the sub-offices. Occupational medical services to the referral centres occur as the need arises. The advantage of itinerant occupational medical services are: direct employee assessment by the occupational health physician with small time-loss from work, direct contact with local referral services and physicians, observation of the workers' occupations and an opportunity to interpret the occupational health service to line managers, employees and local physicians.
Director A also supervises itinerant nursing and employee assistance services to workers throughout the province. An employee assistance service gives counselling and rehabilitation services to workers with an alcohol problem. Nursing services are permanently located in Vancouver and the sub-offices. From the Kamloops office itinerant nursing services are provided in the major referral center in Prince George and to health unit offices in the Okanagan Valley of B.C. Employee assistance services are permanently located in Vancouver. They have regularly scheduled visits to Victoria and provide itinerant services to workers in other areas of the province, as the need arises.

In the Transportation, Communication and Utilities (hereafter referred to as Transport) company itinerant occupational health or occupational medical services is not provided to workers located outside Vancouver. Local physicians are contracted to provide occupational medical services to individual workers when the need arises. The most common service contracted is the pre-placement examination. One advantage to this system is the low cost. Director B says a major disadvantage of this system is the local physician's lack of knowledge and understanding of the nature of the worker's occupation and its hazards. Director B observes that frequently the local physician completes the medical assessment form based on the worker's knowledge and statement. As a result, Director B observes that medical assessments are returned incomplete or questionable. To obtain an appropriate and complete assessment involves additional time of the occupational health physician, and a redundancy of tasks. The redundancy adds unnecessary costs to the occupational health service.

At the time of this study Director B is recommending to management that a sub-office of the Employee Health Service be established in Victoria to serve company
workers on Vancouver Island. An Employee Health Service in this area will eliminate the need to use local physicians to conduct pre-placement examinations. The quality of medical assessments will improve and redundancy of task by occupational health physicians will be eliminated.

Consultant E provides services to workers in four small companies. Two of the four small manufacturing companies are within the same corporate structure. The two companies are subsidiaries to a parent company headquartered in Ontario. The subsidiary companies have policies and procedures in occupational medicine similar to the parent company. Consultant E incorporates these policies and procedures, where applicable, into the occupational medical practice he has in the two other small companies.

Consultant F acts as a resource person to physicians in occupational health programs in two subsidiary companies outside of B.C. A physician in one subsidiary company combines an occupational medical practice with a singular general practice in a small "company" town.

RELATIONSHIPS WITH ALLIED PROFESSIONALS, MANAGEMENT, LABOUR AND GOVERNMENT

In a comprehensive occupational health program, services are directed at the factors that affect the workers' health, the health effect on worker and the linkage of these two aspects of an occupational health program. A complete occupation health program in a company, therefore includes services of industrial hygiene, safety, first
aid and employee health assessments. The organisation of these services differs in the companies in which the six occupational health physicians practise. The following diagram illustrates the organisational structures of the industrial hygiene, safety, first-aid and worker health assessment services in three companies.
Chief Executive Officer (C.E.O.)

Assistant (C.E.O.)

Director of Occupational Health Service

Consultation on request to Companies in the Province

Physicians Nurses

Radiation Protection Service

Employee Development Service

PUBLIC ADMINISTRATION COMPANY

Company Manager

WCB Industrial Hygiene Services

Consultation Occupational Medicine

First-Aid Safety Officer

SMALL MANUFACTURING COMPANY
In the large companies, such as Transport and Public Administration the Directors of the Occupational Health programs, are not directly responsible to the Chief Executive Officer or Manager of the Company. In the Public Administration company it is to an Assistant to the Chief Executive Officer and in the Transport Company it is to a Personnel Officer. Director B (Transport Company) expresses his opinion about reporting to a Personnel Officer, at a middle management level of decision-making in the organization.

"It stymies development of occupational health because of inaccessibility to top manager. Ideally, the Medical Director of Occupational Health Services in the company should not report to any management level lower than the policy-making level which also had direct line authority to implement its health related decisions in this case, the Management Committee. The more layers of non-medical administrators placed between the medical head of a professional Health Service and the ultimate line-authority policy-makers the more constrained, inflexible and misunderstood and ineffective will be the Health Service – such layers serve mainly to delay and inhibit effective communication, understanding and decision-making."

In Director B's opinion, having Employee Health Services reporting to Industrial Relations and Personnel Division contributes to labour's perception of the physician and his staff as pawns of management and an adversary of labour. This situation contributes to Union officials advising their members to "stay away from the company doc." Director B also comments about the education of management about occupational health services.

"It becomes imperative for future development in this field to make a short perspective course on occupational health (in its broad outline with emphasis on cost-benefit ratios) a mandatory prerequisite for any graduate program in Business Administration. It is the future business executives of this province NOT the physicians who have education needs for the future development in occupational health".
In the large organisations, administration of the employee health service and coordination of other occupational health services in the company comprises a major part of the Directors' functions. In the large companies, Directors A and B have line responsibility in the organisation. The following is a list of administrative duties of the Directors:

- assist in setting standards of procedure for occupational health staff;
- assist in hiring and evaluating occupational health staff with whom the physician has direct line responsibility;
- preparation of annual budget of the occupational health service;
- program evaluation of occupational health programs;
- interpretation to management on the health status of their company with recommendations to improve that health status when necessary.

In the four small manufacturing companies, Consultant E is a medical consultant to management on issues of workers health. The organisation structure of the small companies is less complex than the large companies. The small companies have a small number of line managers and committees with whom the physician interacts. The physician is directly responsible to the manager in the companies and this decreases the turnaround time in information-giving, problem-solving and decision-making on occupational health issues.

At the time of this study in 1977, the B.C. Workers' Compensation Board had completed public hearings on proposed W.C.B. Industrial Health and Safety Regulations in British Columbia. Two physicians, Director B and Consultant E had submitted briefs to the W.C.B public hearings on Industrial Health and Safety. These regulations would increase the demand for medical, audiometric and industrial hygiene services. During
the study implications of the W.C.B. industrial health and safety regulations were frequently discussed by the occupational health physicians. The two Directors and the two Consultants identified the current system in their company for providing industrial hygiene services (Table VI).

**TABLE VI**

Sources of Industrial Hygiene Services in Seven Companies in British Columbia (1977).

<table>
<thead>
<tr>
<th>Type of Company</th>
<th>W.C.B. Industrial Hygiene Services</th>
<th>Company Staff I.H. Services</th>
<th>Company Consultant I.H. Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Administration</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Transportation Communication Utilities</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Manufacturing</td>
<td>(a)</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(b)</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(c)</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(d)</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Manufacturing/Mining</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

All physicians state that the Workers' Compensation Board Industrial Hygiene Division conducted an annual inspection of their company. This industrial hygiene
service is to comply with Workers' Compensation Board Industrial Health and Safety Regulations.

In the seven large companies, industrial hygiene services are available within the company. In the Public Administration company, a specialist in radiation provides industrial hygiene services in this specialized field. He reports to Director A. In the Transportation, and Mining/Manufacturing companies the placement of industrial hygiene services within the company structures differs. In the Transportation company the new industrial hygiene services are located in the Safety Department. In the Manufacturing/Mining Company the industrial hygiene services are located in the Environmental Control Department. This department is responsible for the external and internal environment of the company.

Directors B and Consultant F comment on the location of the industrial hygiene services in their companies. Director B says:

"Industrial hygiene services increase with new demands of W.C.B. and industrial health and safety regulations. This will require increased liaison with new industrial hygienist, closer liaison with production site supervisors and work-site visits. I am advocating to management a closer working relationship between safety department (industrial hygienist) and the employee health service by establishing a standing committee with weekly contact."

Consultant F says:

"Health safety and hygiene are all interrelated and unless there is good liaison the function of the occupational physician becomes extremely difficult. The Industrial Hygienist should be considered the controller of the internal environment of the plant... There is certainly some association of the occupational physician with the external environment but it is not as close a relationship as to the above."
Depending on the organization of the particular company the Manager of Environmental Control, in my opinion, should have control over not only the Industrial Hygiene but the external environment. The Manager of safety is a separate entity but closely related to the occupational physician could have control of all of these aspects whether or not this is a good idea is debatable."

In the two subsidiary companies, Consultant E uses a company industrial hygienist from the parent company. The industrial hygienist provides annual inspection services on request or special studies of the work environment. In the two other small companies, Consultant E requests the industrial hygiene services of the Workers' Compensation Board. Consultant E has a policy that when establishing a new occupational health service in a small company, management has to agree to an industrial hygiene assessment by W.C.B. Consultant E and the W.C.B. industrial hygienist jointly assess the industrial hygiene and house-keeping of the company. In Consultant E's opinion "you then know what you are dealing with". From this information Consultant E explains the physician can plan an occupational health program that assesses the workers health and occupational hazards. From these assessments measures can be implemented to prevent illness and injury, control environmental hazards and protect the worker. Consultant E has not experienced any conflict with management and the policing/consultation role of the B.C. Workers' Compensation Board industrial hygiene division in instituting this policy. He comments that in his experience this approach results in a positive relationship between management, occupational health physician and industrial hygienist.

In the three large companies industrial hygiene laboratory services are located within the company or external to the company. The Workers Compensation Board has a laboratory service at their Headquarters in Vancouver. These laboratory services can be used by companies at any time.
Director B in the Transport company is the only physician who works with an industrial psychologist employed by the company. The psychology services are a part of the industrial relations and personnel division of the company. Although Director B works closely with psychological services, there were no formal policies or procedures for liaison and/or referral between the psychology and employee health services.

The occupational health physician relates to the personnel department regarding Employee benefits such as Disability and Life Insurance. Director B advocates that the occupational health physician should be consulted regarding medical requirements, in labour relation contract discussion.

In occupational health programs occupational health physicians inter-relate with a variety of occupational health professionals and auxiliary personnel. Table VII illustrates the type of occupational health staff under the direction of the Directors and Consultants in Occupational Medicine. Although physicians in the large companies all give direct service to employees, this task is frequently delegated to other appropriate members of the occupational health staff; staff physicians, nurses, laboratory technicians.

The two staff occupational health physicians report directly to the Directors of Occupational Health Services in their companies. The staff physicians in these companies accept referrals, assist in assessment of workers' health problems, counselling, periodic health reviews, follow-up counselling, and consultation with line managers on illness and absenteeism. Staff physician C is designated a member of the B.C. Pollution Control Board.
TABLE VII

Type and Number of Staff under the Direction of four B.C. Occupational Health Physicians (1977).

<table>
<thead>
<tr>
<th>Category of Physician</th>
<th>Type and Number of Personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Physicians Staff</td>
</tr>
<tr>
<td>Director A</td>
<td>3</td>
</tr>
<tr>
<td>Director B</td>
<td>1</td>
</tr>
<tr>
<td>Consultant E</td>
<td>-</td>
</tr>
<tr>
<td>Consultant F</td>
<td>2</td>
</tr>
</tbody>
</table>

Director A has an X-Ray department available in some of the sub-offices. In the referral centers, workers are sent to public and private X-Ray agencies in the area. Director B, Transport Company, has X-Ray facilities and employs laboratory technicians. In his opinion this service pays for itself in avoiding time-lost. At the time of the study, management was reviewing services in all company departments. Because of economic constraint Director B had to justify occupational health services to management. Management had questioned if the X-Ray services was a duplication of services in other parts of the health care system and one that could be eliminated. Management questioned the cost of sending the worker to public and private agencies for X-Ray and routine laboratory blood and urine tests vs. the cost of a company maintained service.
The large companies employ counsellors for alcohol and drug-related problems in workers. These counsellors are labelled employee development or employee assistance counsellors. In the Transport and Mining/Manufacturing companies the employee assistance counsellors are directly responsible to the Personnel Manager. In the Public Administration Company the employee assistant counsellor reports to Director A. Counsellors have continuous education programs with line managers and workers, on recognizing and managing workers with alcohol and drug related problems. Workers are referred to the counsellors by co-workers, self, family members, line managers and occupational health physicians. The counsellors advise employees with drug and alcohol related problems. They use community agencies such as Alcoholics Anonymous (A.A.) and Alanon to assist the alcoholic and his family members. Director A and Consultant F highly praise the company employee assistance counsellor who assists with alcohol problems. Both physicians state this is an important and cost-beneficial service to the company and the employee. They have observed good results since implementation of the employee counsellor service. In the Transport company Director B also consults the services of the B.C. Drug and Alcohol Commission when appropriate.

In the small companies, employee assistance counsellors were not hired by the Company. Consultant E refers workers with drug and alcohol related problems to agencies in the community where the worker resides such as Alcoholics Anonymous (A.A.) and Alanon. Consultant E who uses community based A.A. programs or their proto-type stated that he experiences good results with workers that attend, and excellent co-operation with these community based programs.
The industrial first aid attendants work with the occupational health physician. The number of first-aiders employed by the company is determined by the British Columbia W.C.B. Industrial First Aid Regulations. All hold an industrial first-aid attendant certificates approved by the Workers Compensation Board. The attendants provide emergency services and in the absence of the doctor or nurse have the authority to arrange transport of employees to hospital or to doctors offices for treatment.

Director A is chairman of a joint management/union committee of the occupational placement of workers with health problems. Personnel directors attend the meeting reporting on workers with health problems and receive the recommendations of the committee. Management and Union jointly decide on appropriate action to be taken regarding the continued employment, retraining or dismissal of the worker. Union and management co-operate in developing a working environment for workers with health problems in order to maximizing the performance of the worker's performance within his capabilities. In one case, job tasks were rotated and a work desk elevated to minimize back pain in a previously injured worker. In another case, a worker with a recent cardiac disease was retrained in an occupation with less lifting. In a third case, management and union agreed to an early pension for an ill worker. Director A says union and management work well together, resulting in successful placement of workers with health problems. The Director A praises the committee for effectiveness in the appropriate placement of workers with long-term, and disabling health conditions.

Consultant F also participates in a rehabilitation committee of sick or injured men trying to be restored to company employment. The committee consisted of
members from Personnel department, Safety department and the occupational health nurse.

In one small company, Consultant E works directly with management in adjusting a worker's occupational environment. In another small company, Consultant E helped management to decrease the potential hazard to the worker. In this case, the height of the worker's workstation was adjusted to decrease his backstrain. In more than fifteen years of employment, the worker had not been absent because of a back injury. The simple adjustment to the worker's occupational environment saved the company many dollars, in disability insurance premiums, absenteeism and worker retraining. W.C.B. was saved compensation cost; the insurance company was saved disability costs, hospital and medical costs and the worker was saved days of pain and discomfort. This situation illustrates the many cost-benefits of preventive occupational medical practice.

The six physicians work in co-operation with safety directors and industrial hygienists. Two physicians work with the company industrial hygienist in developing a toxic surveillance program. In the Mining/Manufacturing company the results of workpeace and worker assessments are co-ordinated in their system of records. Employee educational programs are conducted if necessary and recommendations made to management. In the Transport Company Director B says he was not included with the team of professionals to investigate a toxic chemical (PCB) spill in the external environment. The team of professionals included chemists and industrial hygienists. Director B says the Employee Health Service does not have specific program objectives about the workplace environment and there is no formal link between company environmental staff and Director B. Director B is advocating to
management a closer working relationship between the safety department with the new industrial hygiene position and the Employee Health Service. Director B suggests that a standing committee with weekly meetings be established. Ideally, the Director says there should be a co-ordinated record keeping system between the worker and the results of an industrial hygiene surveillance in the workplace. A co-ordinated record keeping system exists in the Mining/Manufacturing company.

TYPE OF TASKS PERFORMED

Preplacement Examination

The six physicians conduct re-placement examinations to comply with company policies and statutory requirements. Companies develop their own policies on identified "risks" occupations. The policies are developed by the occupational health physician; for example, a procedure for back evaluation in occupations with heavy lifting. In the case of two small subsidiary companies the policies were developed by the Medical Director in the parent company. The seven companies varied in their company policies for preplacement examinations. One company says that the preplacement examination is to be given prior to hiring; another company policy says the preplacement examination is to be given within three weeks of starting work.

In the seven companies, statutory regulations that legislators the frequency and type of biological testing for the preplacement and periodic examinations are:

B.C. Workers Compensation Board Industrial Health and Hygiene Regulations
Industrial Transportation Act
Interstate Transport Commission
B.C. Health Act
B.C. Mines Regulation Act

The Industrial Health and Hygiene regulations of the B.C. Workers' Compensation Board regulate some of the tasks performed by the six physicians.

Director B in the Transport Company reports that he and his staff did 2,000 preplacement examinations per year. This number of examinations represents an 80% compliance with the company policies and use 36% of the health services operating budget. Compliance in other companies is not known. All occupational health physicians conduct preplacement examinations. Directors A, Director B and Consultant F frequently delegate the task of preplacement examinations to staff occupational health physicians. In one small company a nurse assists Consultant E with preplacement examinations. In three small companies, Consultant E did the tasks himself.

In the Transport Company, Director B contracts the local physician to conduct the pre-placement examination for workers residing and working outside the company headquarters area. This is described in detail on page 86. The local physician frequently was the worker's family physician. Table VIII shows the type of Workers receiving preplacement examinations in four industries in British Columbia.
TABLE VIII

Types of Workers Receiving Pre-placement Examination in Four Industries in British Columbia (1977).

<table>
<thead>
<tr>
<th>Category of Industries</th>
<th>Classification of Employee</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Casual</td>
</tr>
<tr>
<td>Public Administration</td>
<td></td>
</tr>
<tr>
<td>Transport Communication and Utilities</td>
<td></td>
</tr>
<tr>
<td>Manufacturing</td>
<td>X</td>
</tr>
<tr>
<td>Mining/Manufacturing</td>
<td>X</td>
</tr>
</tbody>
</table>

Various techniques are used by the physicians in conducting preplacement examinations. These techniques are illustrated in Table IX.
TABLE IX


<table>
<thead>
<tr>
<th>Category</th>
<th>Complete Physical</th>
<th>Questionnaire</th>
<th>Specific Physical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Administration</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Transport Communication Utilities</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Manufacturing</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Manufacturing/Mining</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

On completion of the physical examination the occupational health physician counsels the worker on health problems and refers the worker to his family physician for further investigation and treatment. The six occupational health physicians share the worker's health problem with the family physicians after obtaining signed consent. (Appendix J). All the worker's medical records are confidential. The worker with social or lifestyle problem is referred to services within the occupational health services or to community agencies. Employees working in "at risk" occupations are informed of the risks, told ways of preventing risks or how to protect themselves from such risks. Some of this teaching is done by the physician or the appropriate staff member of the occupational health service or company. After counselling the employee the physician classifies the employee according to his fitness for the job.
There were three classifications in the Manufacturing/Mining Company and five classifications in the Transport Company that describes the levels of fitness of the workers. The classification standards are established by the company. In two companies the workers' classifications are given to the employer if the worker signs a consent. One example of a consent form is contained in Appendix I. Information obtained in the pre-placement examination becomes a part of the employee's confidential health record.

**Periodic Examination**

In the seven companies periodic examinations are statutory or voluntary. One small manufacturing company offers a voluntary periodic examination to employees in specific age groups. The age grouping and frequency of examination are:

- every three years to age 35
- every two years to age 36 - 45
- every year to age 46

In the small industries, Consultant E conducts interviews with workers on job transfers or promotions. Consultant E gives special attention to workers promoted from a staff position to a line management position. Consultant E considers these workers "at risk of stress". He talks with the worker about the new job responsibilities, the risk of stress and means of coping with it. Workers that coping with stress in an appropriate way, are reviewed periodically.
Periodic health examinations must meet W.C.B. Industrial Health and Hygiene Regulations, Inter-state Transport commission, Motor Vehicles Act, and B.C. Mines Regulation Act. The W.C.B. Industrial Health and Hygiene Regulations are referred to by all physicians. Three industries, Public Administration, Transport and Mining/Manufacturing complies with more than one Act or Regulation. The Transport Company must comply with three different regulations governing transport drivers. Two standards are established by two B.C. provincial acts. A third standard has been established in the United States. Each standard differs in the frequency and type of periodic examinations required. Director B says that complying with this type of fragmented legislation by "two arms of B.C. government" is time consuming for the worker, the physicians and occupational health staff. Although not mentioned by Director B, this redundancy would be costly to the company in physicians time and worker time off the job. This system results in redundant massive paper work. To Director B, a more acceptable situation is a single set of standards in B.C. and acceptance of a recent periodic examination by the United States Interstate Transport Commission.

All occupational health physicians counsel workers about illness or potential illness because of the workers lifestyle or occupational hazards. Individuals counselled are workers, or their line managers. Counselling occurs during preplacement and periodic examinations, on referral from management, union, or self referral. The occupational health physician after detecting illness in a worker advises the worker to obtain further investigation or treatment from his family physician. In emergency situations, or if the worker is not a resident to the area, Consultant E sees the worker at his office. On written consent of the worker, information on the health status of the worker is conveyed to his family physician. All seven companies had this policy in
effect. Lifestyle counselling about nutrition, smoking, alcohol consumption, high blood pressure, exercise, and stress is given by the appropriate occupational staff member in the large companies. The appropriate occupational health staff member can be the nurse, physician, nutritionist, employee assistance counsellor or fitness expert.

In small companies Consultant E refers workers with lifestyle health problems such as obesity and post-cardiac illness to local community agencies such as Y.M.C.A., T.O.P.S. (Take off Pounds Sensibly), Weight Watchers. Two physicians report that the most difficult counselling was workers with mental illness. Director B spends much time with line managers counselling them to accept and implement their responsibility to advise workers about job performance expectations and in cases where the worker is not meeting these expectations to evaluate the worker on job performance not possible illness. Director B sited a case where the worker with repeated behavioural illness remained on the job. The Director had advised personnel that this action could be to the detriment (safety) of fellow workers. The physician had to live with the decision of management. He did not live with this decision comfortably.

The Directors and Consultants are involved in occupational health program development, evaluation and facility planning. Three occupational health physicians discuss the development of back evaluation programs for workers. The physicians working in Public Administration, Transport, and Mining/Manufacturing said that back injuries are the most difficult injury amongst workers to treat. Many workers with back injuries are receiving compensation benefits. Prevention is the best answer to the problem of back injuries. The physicians identify occupations with continuous or sporadic heavy lifting. One physician conducts a physical stress test and two other physicians had developed back evaluation examinations. Two physicians did individual
counselling on prevention and protection of back injury. The Mining/Manufacturing company has a compulsory back education program given by the Safety Department staff. Films, demonstrations and hand-outs are the educational materials used in the program. The occupational health physicians assist in the education of this program. All six physicians say back X-Rays are part of the preplacement and periodic examination in specific occupations with heavy lifting.

The Public Administration Company developed an employee fitness program. The operations in this part of the company is predominantly administrative and the occupations sedentary. In this group of workers fitness is important for the prevention and protection of occupational and non-occupational diseases resulting from stress, lower back pain, high-blood pressure, obesity, smoking, inactivity. The services offered are nutrition counselling, fitness assessment and exercise counselling, personalized and informal exercise programs, fitness information in the form of a library, newsletter, seminars and films. These services aim to modify the employees' current lifestyle to promote maximum fitness. The program encourages the use of recreational or fitness facilities in the community, at home and at the fitness centers. A ten week personalized program is offered to the worker and at the end of the program a re-assessment is done. Informal programs, such as bicycling and hiking are offered for workers already fit. These informal programs are done on non-work time.

Because of financial constraint in the Transport Company, all company departments including Employee Health Service was in a process of review. Director B was planning to hire university students to assist with the program evaluation. The program evaluation involves a retrospective statistical analysis of services provided, a cost-analysis of services, and a prioritizing of services according to cost-benefit.
Director B is planning to develop a sub-office on Vancouver Island to serve a large number of workers in Victoria and Vancouver Island. The raison d'être for the sub-office was discussed earlier in this study.

In the Public Administration industry, Director A said he had been an advisor to the planning of a new mining/manufacturing company. Environmental impact studies were conducted to recommend the best site for the company from an environmental perspective. Long-term prospective studies on the health of company workers and residents in the area of the new company were planned.

In one small company Consultant E assists a committee composed of B.C. Emergency Services Planning and company personnel. The committee formulates an emergency services plan in the event of disaster at the company such as fire or a toxic chemical spill. Consultant E is planning with the Manager of an Industrial Park in Vancouver, an occupational health center for the industrial park. The occupational health center will have a staff of physician and nurse who will provide occupational health services to all companies in the park on a cost sharing per capita basis.

Five occupational health physicians report that they taught groups of workers, line managers, safety officers, and senior company executives. Staff occupational health physician D had no opportunity for teaching in his present position as he had been on the job for the Transport Company for only one week. Subjects taught are environmental hazards in specific occupations, safety procedures, and techniques of prevention and control of hazards and protection devices for workers exposed to various environmental hazards, e.g. stress, heat, chemicals, and toxic gases. Director B says that physicians should participate in the training of personnel managers and line
managers in how to deal effectively with problems related to the Health Services Department. Consultant F developed a video-tape on prevention and control of lead toxicity in the worker. All new workers, in occupations with lead exposure are required to view this tape. The tape is also used as a review to other workers when required. This technique saved occupational health staff time on initial education of workers. Consultant F also did some teaching in the company-sponsored pre-retirement education program. Three of the occupational health physicians were teachers at a B.C. University, they also lectured at professional organizations, and occupational-health related agencies.

Professional Education and Clinical Practice

Illustrated in Table X are the number of years in medical practice including the years in occupational medicine for the six physicians.

Table X

The number of years between medical graduation and 1977 of six B.C. occupational health physicians.

<table>
<thead>
<tr>
<th>Category of Physicians</th>
<th>11-15 Yr.</th>
<th>16-20 Yr</th>
<th>21-25 Yr.</th>
<th>26 + Yr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>*Directors A</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Staff Physicians</td>
<td>C</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>D</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Consultants E</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

*Source: Canadian Medical Directory 1977.*
The average number of years in medical practice for the six physicians as 24.5 years.

Director A, prior to practicing occupational medicine, practiced in general medicine. The two Consultants had other types of medical practices than occupational medicine; Consultant E has a general practice; Consultant D is part of a group practice where he is the Specialist in Internal Medicine.

Table XI

Number of years in the practice of occupational medicine of six B.C. Occupational health physicians (1977).

<table>
<thead>
<tr>
<th>Category of Physician</th>
<th>5-10 Yr.</th>
<th>11-15 Yr.</th>
<th>25 + Yr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Directors</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Staff Physicians</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Consultants</td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>E</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

The average number of years in occupational medicine of the six B.C. occupational health physicians is 12. All occupational health physicians in the study had extensive experience in the practice of occupational medicine. This ranged from 5 years to more than 25 years.

Illustrated in Table XII is the type of post graduate education and country where the education was obtained of six occupational health physicians.
### TABLE XII

Post graduate education in occupational medicine and country where obtained of six B.C. occupational health physicians, (1977).

<table>
<thead>
<tr>
<th>Category of Physician</th>
<th>Type of Post-Graduate Education</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>D.P.H.</td>
<td></td>
</tr>
<tr>
<td>Directors</td>
<td>D.I.H.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>FRCP (C) INT. MED.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>FRCP (C) PH.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>DABPM</td>
<td></td>
</tr>
<tr>
<td></td>
<td>FACP</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CAN.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>U.S. A.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>U.K.</td>
<td></td>
</tr>
<tr>
<td>Staff Physicians</td>
<td>A</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>C</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>D</td>
<td>x</td>
</tr>
<tr>
<td></td>
<td>E</td>
<td></td>
</tr>
<tr>
<td></td>
<td>F</td>
<td></td>
</tr>
</tbody>
</table>

Source: Canadian Medical Directory 1977.

- D.P.H. diploma in public health
- D.I.H. diploma in industrial health
- FRCP (C) INT. MED. Fellowship of Royal College of Physicians and Surgeons in Internal Medicine.
- FRCP (C) P.H. Fellowship of Royal College of Physicians and Surgeons in public health.
- D.A.B.P.M. Diploma American Board of Preventive Medicine
- F.A.C.P.M. Fellow of American College of Preventive Medicine (elected to this)
Three of the six physicians have post-graduate diplomas and Fellowship degrees appropriate to occupational medicine. The post-graduate diplomas and Fellowship degrees are diplomas in public health; diploma in industrial health; Fellowship in Public Health and a Fellowship in Internal Medicine. Consultant F. is a Specialist in Internal Medicine. About the time this physician obtained his Fellowship in Internal Medicine, occupational medicine was considered a sub-specialty of Internal Medicine. For this generation of physicians, the Fellowship in Internal Medicine is considered appropriate post-graduate education for practicing occupational medicine. The most recent graduate of the six physicians has the most academic preparation in occupational medicine. This parallels the predicted trend that recent graduates choosing occupational medicine as their fields of practice will obtain additional preparation in this field. Director B does not have post-graduate medical diploma or degree in occupational medicine, but he does have additional preparation in labour relations and administration. In his opinion, education in labour relations and administration is essential to a physician practicing occupational medicine in a company. In his opinion such knowledge assists the physician in his relationship with union, management and workers. The physician diagnoses management's style and uses this knowledge to select methods to implement health promotion in human resource management of the company. The physicians also gain knowledge on ways to motivate workers. This knowledge assists the physician in diagnosing some of the psychosocial factors in the work environment which may be detrimental to the workers' health. Director B says that courses in labour relations and administration should be included in the academic preparation of occupational health physicians.

The six physicians have attended continuing education courses in Canada and the United States. Two physicians said most of the courses and conferences were in the
United States. Five physicians stated said they had some continuing education courses funded in whole or in part by their companies.

All physicians are active members of professional associations related to occupational and preventive medicine. Director A, Consultant E and staff physician C are members of the American Public Health Association. Staff physician C is also a member of the Canadian Public Health Association. All physicians are members of the British Columbia Medical Association Occupational Health Division.
CHAPTER VI

DISCUSSION OF RESULTS

The role of the occupational health physician is bound by the perceptions of management and labour about the practice of occupational medicine, the availability of allied occupational health professionals, legislation and the professional practice of medicine. Within these areas several issues are raised about the practice of occupational medicine.

All the occupational health physicians in this study were directly employed by management. Such employment may be detrimental to his relationship with workers. Workers may perceive the physician as in the employ of management. Hiring of a physician by third party agency may put the physician at arms length to management and improve labour's perception of the physician's role. Third party agency services could be provided by, local health units, independent occupational health and safety services providing services to a group of small industries, or an occupational health and safety service sponsored by a union. These various types of occupational health and safety services by third party agency should be tried and evaluated for effectiveness and cost.

Recommendation: that the government financially assist in the development of occupational health and safety services by third party agencies. The occupational
health services provided by third party agencies should be evaluated for effectiveness and cost.

Industrial hygiene services are complementary to occupational medical services. The emphasis of one over the other can be detrimental to determining the cause/effect relationship between occupational hazards and the workers health. Management in small industries finds it costly to employ an industrial hygienist. Management may be reluctant to obtain services from a regulatory agency such as Workers Compensation Board fearing costly adjustments to their workplace. Industrial hygiene services from a non-regulatory agency need to be developed for small industry.

One way non-regulatory industrial hygiene services could be developed is by a third party agency, e.g., occupational health center.

**Recommendation:** That in establishing third party occupational health services, industrial hygiene services be an integral part of the service.

Although industrial hygiene and occupational medical services are essential to establishing a complete occupational health service, this is not always observed in practice. Problems arise in management's perception of industrial hygiene and occupational hygiene and occupational medicine as services complimentary to each other. In a company, the services of industrial hygiene and occupational medicine, need to be formally linked to establish policy and plan a preventive approach to the
development of occupational health services. This linkage can be reflected in the formal organization of the company and the administration of a co-ordinated record system about the worker and his occupational environment.

**Recommendation:** That management and Labour acquire more education on the complimentary roles of the industrial hygienist and occupational health physician. Emphasis should be placed on the organizational and administrative methods of linking these two services in a company. This education could be through a system of seminars sponsored by professional associations and educational institutions.

In nine out of ten types of industries, government agencies have legislative sanctions or regulations about occupational health and safety. Agriculture (and some of the construction and service industries) have no government agency involved in occupational health and safety. Government agencies involved in Occupational health and safety are; Worker's Compensation Board and the Ministries of Labour, Mines, Health and Environment. These various government agencies, contribute to the fragmentation and redundancy of occupational medical practice, e.g., preplacement and periodic medical examination. This fragmentation and redundancy adds to the cost of occupational medical services.

Saskatchewan, Alberta and Ontario have consolidated several occupational health acts into a singular act administered by one government department.

Similar action in British Columbia would decrease the fragmentation redundancy and cost of occupational health services. A single act administered by one Ministry
would clearly identify the government policy on the development of occupational health and safety programs in industry.

**Recommendation:** That the government of British Columbia investigate the extent and cost of redundancy and fragmentation of acts and regulations pertinent to Occupational Health and Safety and the merits of a single Occupational Health and Safety Act in British Columbia.

Physicians in this study performed tasks designated by legislation, goals of occupational health services and professional standards. Following preplacement examinations, pertinent to the workers occupation the physician gives preventive and health promotion counselling to the worker. Studies have suggested that screening techniques for the identification of workers classified as "doubtful" or "vulnerable" could be conducted by allied occupational health staff such as nurses. The extent of this practice in B.C. occupational health services should be surveyed.

**Recommendation:** That the extent of screening "doubtful" and "vulnerable" workers in the preplacement examination by a questionnaire or nurses should be surveyed in B.C. occupational health services. Such a survey might be jointly sponsored by Registered Nurses Association of British Columbia, and British Columbia Medical Association. From such a survey a position paper on the roles of physician and nurse in preplacement screening could be developed.

Results of the study suggests that part-time occupational health physicians need easily accessible post-graduate and continuing education courses in occupational
medicine. An appropriate form of post-graduate education could be at the diploma level. Greenhill and May suggested that a diploma program in occupational medicine be established in the Western provinces. A similar recommendation was made in the Foulkes report. Some part-time occupational health physicians might find it difficult and costly to leave their medical practice for a full year to obtain a diploma in occupational medicine. Offering the diploma program by a system of incremental short-term credit courses, might be more acceptable to the physician candidate.

**Recommendation:** That a post-graduate diploma program in occupational medicine be established at University of British Columbia. A system of incremental short-term credit courses, leading to diploma should be explored. If such a diploma program was established a further recommendation would be to have some of the courses available for other occupational health staff such as nurses, engineers or environmental control offices (public health inspectors). A multi-disciplinary education assists in a multi-disciplinary approach in practice. Such an approach is appropriate in the practice of occupational health service.

The practice of occupational medicine is not a recognized specialty in Canada. The Royal College of Physicians and Surgeons of Canada debates the placement of occupational medicine within its various categories of practice of medicine. This dilemma of where occupational medicine fits into scheme of medical practices carries over into the system of medical practice. The role of the occupational health physician is questioned by family physicians and specialists, who perceive the occupational health physician as interfering in their practice rather than complementing their practice. Management is unable to distinguish between the
various types of medical practice and does not have a professional standard to guide it.
The Royal College of Physicians and Surgeons of Canada designating occupational medicine as a recognized specialty or subspecialty would enhance the professional status of occupational health physicians among colleagues, management and labour.

**Recommendation:** That the Royal College of Physicians and Surgeons quickly resolve the designation of occupational medicine as a special category of medical practice.
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APPENDIX A
Guidelines for Interviews and Observation with Occupational Health Physicians.

NAME OF COMPANY -
IES -
which provide
O.H. Services

# of employees
in Company

# of employees
O.H. services
campaign

- does company have shifts?

- major occupational groups served.

- services are provided in O.H. service

- do you have a print-out of objectives and services?

- do you have a job description - have a copy?

- who do you relate to directly?
  management
  personnel
  other

- who set your policies?
  central office
  yourself
  local management
  professional assoc.
  union-management
  other

- as a physician do you have affiliation with any O.H. groups?
  OSHA
  NIOSH
  BCMA environmental group
  CPHA
  other

- why did you go into Occupational Health?
COMMUNITY HEALTH GRADUATE PROGRAMS at the UNIVERSITY OF TORONTO

Master of Health Science Degree

Graduate professional programs leading to the degree of Master of Health Science are offered in the following areas of specialization:

Community Health and Epidemiology
The Community Health and Epidemiology program concentrates on the knowledge and skills needed to investigate and assess community health and to establish programs to promote health, prevent disease and provide optimal health care. Physicians planning to enter the field of community health as Medical Officers of Health enrol in this program; other students will be expected to concentrate in one or more specific program areas such as biostatistics, epidemiology or family health.

Community Nutrition
Prerequisite specialized knowledge of nutrition and related sciences is further developed and expanded to include an understanding of the relevant community health subjects and to prepare the student to apply this knowledge in the consultant role of the public health nutritionist. A major focus of the program is the assessment of nutrition needs and resources in the community, and the planning, implementation and evaluation of community programs to meet those needs. Most graduates fill consultant roles in official public health services or large community agencies.

Health Administration
The Health Administration program concentrates on developing the knowledge and skills required for senior level managing, planning and evaluation of health care institutions, agencies and programs. Students particularly interested in one area of health administration (such as acute care institutions, long term care, mental health or community health agencies) may develop that focus through the selection of electives.

Health Promotion
The objective of this program is to produce professionals who can assess the health promotional needs of communities on a systematic basis, to design, implement and evaluate programs that meet those needs. A range of roles for graduates with this specialty is anticipated, including work in the field of social policy at all levels of government, in community program development, and as health education specialists who would act as resources for other health professionals and agencies.

Occupational and Environmental Health
This program is designed for physicians, biologists and other scientists, nurses and others with appropriate training who wish to work in occupational health and safety, occupational hygiene, toxicology and environmental health. Upon satisfactory completion of the program physicians and health scientists should be able to compete for jobs over a wide range including international agencies, the departments and agencies of government, industry and commerce, consulting, teaching and research; and for the growing number of openings in employers organizations and labour unions.

Depending on the area of specialization MHSc programs can be completed in 15-22 months. This includes time spent gaining practical experience through field placements in the chosen area of study. A thesis is not required.

Diploma in Industrial Health and Certificate in Public Health
Professional programs leading to the Diploma in Industrial Health and the Certificate in Public Health are available for those who do not wish to undertake a program of the length, scope and degree of specialization expected in the Master of Health Science programs. Full time students can complete these programs in a single session of approximately 9 months duration.

Master of Science and Doctor of Philosophy Degrees
Graduate programs leading to M.Sc. and Ph.D. degrees are offered for those interested in research or academic careers. Original research in a specialized area of community health is the primary requirement of the programs. A minimum of two full years is usually required to complete a research degree.

Royal College Fellowship in Community Medicine
An approved residency program in community medicine leading to F.R.C.P.(C.) certification is available. This program is limited to physicians who are Canadian citizens or landed immigrants.

Admission Requirements
Applicants for the above programs will be expected to have completed an undergraduate degree with a grade 'B' standing or better in an area appropriate to their proposed field of graduate study.
July, 1977

Dr. 
Address

Dear Dr. :

Field Observation of Occupational Health Services

I am currently a candidate in the M.Sc. Health Care Planning Program at U.B.C. As my thesis topic, I have chosen to develop a questionnaire to measure the activities of physicians in Occupational Health. As part of my data collection, it is necessary to observe and interview physicians practising in the field of Occupational Health.

Would it be possible for me to observe your activities in Occupational Health for a minimum of two days and not exceeding four days? I would be interested in observing the full scope of your activities both at the plant site, in private practice and any other locale in which you practice Occupational Health. The observations and interviews would be anytime of your choosing between July 25 - Aug 20, 1977.

I hope you can provide me with the necessary field experience. I anticipate hearing from you as soon as possible.

Yours sincerely,

Sandra McKenzie  
M.Sc. candidate U.B.C.
APPENDIX C2

Background Information

Miss McKenzie is a second year student in the M.Sc. program in Health Care Planning at U.B.C. She has completed her course work and is currently working full-time on her thesis, studying the activities of physicians in Occupational Health. Miss McKenzie became interested in the topic while compiling a report on B.C. Occupational Health Services for the Health Manpower Working group in July 1976.

Miss McKenzie has been actively interested in community health throughout her career. She graduated from McMaster University in 1962 with a Baccalaureate degree in nursing and a diploma in Public Health Nursing. Miss McKenzie's career has ranged from nurse-in-charge of Brockville Branch of V.O.N., a teacher in two year nursing program at Mohawk College, Hamilton, Ontario to eight years with the B.C. Public Health Nursing dept., four as senior nurse Simon Fraser Health Unit, Port Coquitlam office. On September 1, 1977, Miss McKenzie will return to the B.C. Department of Health as Nursing Supervisor/Acting Director of the Cariboo Health Unit. On completion of the study on physician activities Miss McKenzie felt she would add to her scope of knowledge of community and environmental health and to her understanding and practice of research in the field.
APPENDIX D

CATEGORIES FOR RECORDING, INTERVIEWS AND OBSERVATIONS OF OCCUPATIONAL HEALTH PHYSICIANS

1. Type of Employment
   type of industry
   number of employees
   organizational chart
   location of employees
   to whom the physician was responsible in the company
   location of safety and industrial hygiene service in the organization
   the presence or absence of a union in the organization

2. Relationships with Allied Professionals, Management, Labour and Government
   staff in the occupational health service
   personnel within the organization with whom the physician worked
   agencies and personnel outside the organization with whom the physician worked

3. Type of Tasks Performed
   aims and objectives of the occupational health service
   preplacement physical examination
   periodic examination
   industrial hygiene
   counselling
   teaching
   research
   administration
   planning programs
   other

4. Professional Information of the Six Physicians
   number of years in occupational medicine
   post graduate education, type and country
   number of years in medical practice
   country of basic education
   professional affiliations
   continuing education
   location of practice

5. Future Development of Occupational Health Services in B.C.
   opinions of the physicians
APPENDIX E

B.C. Workers' Compensation Board
Industrial Health & Safety Regulations (1980)

INDUSTRIAL HEALTH AND SAFETY COMMITTEES

4.04. (1) The Industrial Health and Safety Committee shall have:

Committee membership

(a) not fewer than four regular members, employed at the operation and experienced in the types of work carried on at the operation, and

(b) membership chosen by and representing the workers and the employer. In no case shall the employer's representatives outnumber those of the workers, and

(c) a chairman and secretary elected from and by the members of the committee. Where the chairman is an employer member the secretary shall be a worker member and vice versa.

Provision of additional committees

(2) Where the size or nature of the operation precludes the effective functioning of a single committee, additional committees may be established as the situation requires, or as directed by an officer of the Board.

Function

4.06 (1) The Industrial Health & Safety Committee shall assist in creating a safe place of work, shall recommend actions which will improve the effectiveness of the industrial health and safety program, and shall promote compliance with these regulations.

Detailed duties

(2) Without limiting the generality of the foregoing, the Committee shall:

(a) (i) determine that regular inspections of the place of employment have been carried out as required by regulations 8.08; and

(ii) determine that accident investigations have been made as required by Section 6, and

(iii) recommend measures required to attain compliance with these regulations and the correction of hazardous conditions, and

(iv) where feasible, appoint at least one worker member and one employer member to participate in such inspections and investigations, and
(b) determine that the structures, equipment, machinery, tools, methods of operation and work practices are in accordance with these regulations, and

(c) consider recommendations from the work force in respect to industrial health and safety matters and shall recommend implementation where warranted, and

(d) hold regular meetings at least once each month for the review of:

(i) reports of current accidents or industrial diseases, their causes and means of prevention, and

(ii) remedial action taken or required by the reports of investigations and inspections, and

(iii) any other matters pertinent to industrial health and safety.

(e) record the proceedings of the Committee in a form acceptable to the Board, and shall forward the minutes promptly to the employer, who shall make copies available to those involved in the industrial health and safety program, and shall forward a copy to the Board. When requested, copies shall be forwarded to the organization representing the workers.

Effective Date 1/178
APPENDIX F

Periodic Examination Screening Procedure used in Canadian Federal Civil Service

CATEGORIES OF HEALTH SCREENING

CATEGORY I
- A confidential health questionnaire completed by the employee and screened by a nurse. (Abnormal clinical histories will be brought to the attention of a physician who will determine whether follow-up action is necessary).

CATEGORY II
- A confidential health questionnaire administered by a specially trained nurse, who may also perform certain basic investigations, such as blood pressure, visual acuity, audiogram, X-Ray, electrocardiogram, blood sample, etc., depending on the type of work and particular hazards involved. (A qualified technician may carry out some of these procedures).

CATEGORY III
- A confidential health questionnaire, followed by a full clinical history and physical examination performed by a physician, with special investigations, including those outlined in Category II, as required.
APPENDIX G

FIVE MEDICAL CLASSIFICATIONS OF WORKERS FITNESS TO WORK
USED IN ONE MANUFACTURING COMPANY

Upon completion of the examination and receipt of laboratory results, the Company Medical Examiner will assign one of the classifications outlined below and record it.

Five medical classifications are used by the Medical Department:

A. Suited for any type of work without limitations.

B. Suited for any type of work without limitations, but has minor defects. These defects should be corrected, preferably before employment.

Examples - Minor visual or dental defects.

C. Suited for work within specific limitations; applicant has a physical defect which is likely to remain stationary. As it would interfere with certain activities, specific limitations are required.

Examples - Monocular vision, poor colour vision, amputation of limb as result of trauma.

D. Suited for work. Periodic medical supervision will be recommended.

Applicant has a disorder of emotional, mental or physical health. Although the disorder may be under control at present it may be subject to recurrences of deterioration. The disorder may prevent the employee from doing certain types of work and usually specific work limitations will be recommended. Occasionally the only recommendation needed is that the applicant will have periodic examinations at regular intervals. The applicant should be advised to remain under the care of his private physician for supervision of the disorder or condition.

Examples - Rheumatic endocarditis, arrested tuberculosis, controlled diabetes, controlled epilepsy.
E. Not suited for work at the present time.

Examples - Acute illnesses, communicable diseases, severe chronic illnesses, emotional instability, malignant diseases.
APPENDIX H

Sample Letter From Occupational Health Physician
To Family Physician of the Worker

Dear Doctor:

Re:

The above mentioned individual was recently seen in this Health Service:-

   ___ for pre-placement examination;
   ___ examination under our employee health program;
   ___ for consultation.

The following findings were noted:

The patient is being referred to you for further care. Following treatment it would be most helpful if you could return the enclosed questionnaire for our records. This will assure us that the patient has attended you and will also assist us in the proper evaluation of his/her health status. A stamped addressed envelope is enclosed for the convenience of your reply.

Yours sincerely,

Director of Health Services

D70-363(9/76)
APPENDIX I

SAMPLE MEDICAL CONSENT FORMS

The Medical Director,
XYZ Company
Somewhere, B.C.

I hereby authorize and request you to convey to Management any work limitations that are indicated following my periodic examination on

________________________
(Date)

________________________
(Date)

________________________
(Signature of Employee)