

# THE NOVA SCOTIA MEDICAL BULLETIN

## EDITORIAL BOARD

**Editor-in-Chief**  
Dr. J.F. O'Connor

**Associate Editor**  
Dr. A.C. Irwin

Dr. A.J. Buhr  
Dr. J.P. Welch  
Dr. R.W. Putnam  
Dr. T.J. Murray

**Managing Editor**  
Mr. D.D. Peacocke

**Editorial Assistant**  
Mrs. T. Clahane

---

## The Physician's Role in the Health Care System

The recent decision by government to take over the administration of Medical Services Incorporated from Maritime Medical Care Inc. is another example of relegating physicians to a lesser place in the health care game. The President of the Medical Society has made the point forcefully that government is upsetting the health care balance, and he has tried to make government and the public understand the importance of having physicians involved in meaningful ways in managing aspects of our system. Apparently, we will get a further opportunity to participate in the upcoming Royal Commission on Health Care Costs. If we are to do this capably we must understand that the traditional role in our health care system is changing rapidly, and our awareness of this change must be reflected in what we do and say.

For example, we all know and try to follow the technology that is daily adding to what might be offered to the individual patient. While interested, we often leave it to others to decide on the how and why of funding technology and other changes in the system. The particular reasons for its actual implementation, why it is funded and if it is funded, depends on many things which while subtle, are often ignored by practising doctors. The glamour of a particular machine, its backing by certain charities, the lobby strength in the community are often more important factors than the medical need or priority. Community leaders, administrators, civil servants, economists, all are factors in determining what priority a piece of equipment or a change in the system might have. To ignore this is to miss the opportunity to understand why our role is changing. Economics and management of this large industry called 'health' has created whole new groups of people who control the flow of capital into particular areas of health concern.

Hospital Administrators of course, enter into our awareness more and more, but the host of other people that are (or have already) taking control of the system out of our hands often escapes us. Such people as civil servants in the Department of Health, The Canadian Health Economics Research Foundation and health promotion groups talk of 'social marketing' and community health advocacy, and about new perspectives in community health services, while physicians seem to have little input.

At the recent Canadian Public Health Association's meeting in Halifax, it was R.G. Evans, Ph.D., a health planning and policy analyst, who explained what happened in British Columbia in a talk on *Controlling Physician Supply: Restriction of Billing Numbers*. His comments were fascinating and pertinent, but unfortunately few if any practising physicians were present. He noted that power in the medical system goes to those who win in the "psychological unarmed combat", and that everyone is a "partisan". This major public health conference had as its title, *Community Health — Make It Work*. There were a few "hands on, practising community doctors" who were there to talk about community organization, social marketing, communication, co-ordination and advocacy. If practising physicians are aware they are partisans in combat, their absence at this major conference is difficult to understand. There were however nurses, health educators, consultants, social workers, Ph.Ds., biostatisticians, and of course our public health colleagues, thankfully. It is good to see the health care team approach as these people talk about our community health care systems, but the obvious lack of community practising doctors should be noted. Perhaps joining the Canadian Public Health Association might be a useful plan for more practising physicians. One cannot help but feel that the

practitioner is becoming a chess piece, being moved by the other players. Maybe this is indeed the way it should be, but somehow it does not fit with the traditional role.

Again, recently a major national conference on "Health Care in Canada: Can We Afford Unlimited Access", sponsored by the *Financial Post*, was held in Halifax with an international cast, and concerned itself with major issues extremely pertinent to practitioners in this province. Our Minister of Health was there and so were many civil servants, and the Minister admitted that he was open to many of the new ideas being expressed at this conference. The Medical Society of Nova Scotia did indeed send two representatives, but a quick glance during the meeting showed few practising physicians attending. They were of course curing sore throats or doing coronary bypasses, while somebody else determined the priorities, funding and strategy. Once again, maybe this is as it should be, but one cannot help but wonder how rapidly we have become middle managers or less in this system we all care about, for both altruistic and economic reasons.

A reassessment of our place in the health care system is certainly justified, and a more conscious decision on what part we can and should play is required. □

J.F. O'C.

---

## GUEST EDITORIAL

# A Coordinated Home Care Program for Nova Scotians

Franklin White,\* M.D. and Murray Brown,\* Ph.D.

Halifax, N.S.

On June 24, 1987 the Premier of Nova Scotia, the Honorable John M. Buchanan, announced a coordinated home care program for Nova Scotians.<sup>1</sup> This was the culmination of a process of public meetings and consultations carried out by the Nova Scotia Senior Citizens Secretariat, in support of an Interdepartmental Committee of Deputy Ministers established in 1986. In their review of the situation the Deputy Ministers found many components of a home care program already in place in Nova Scotia, with an estimated current value of \$89 million annually.<sup>2</sup>

---

\*Department of Community Health & Epidemiology, Dalhousie University, Halifax, Nova Scotia.

The Committee made the following recommendations:

- The top priority is immediate consolidation and coordination of existing home care services and provision of core services (homemaking and home nursing), throughout the province;
- Co-ordination of the program should be implemented at three levels — provincially, locally and for each individual case;
- Provincially a distinct organizational body should be established to operate the coordinated home care program;
- A coordinated home care program should be highly visible and easily accessible to Nova Scotians.
- The program should include assessment and co-ordination of nursing and homemaker services with other related home care services included where available.
- There is potential to expand the program to include physiotherapy, occupational therapy and other services as additional resources become available;
- Assessment of program needs and the delivery of services should be undertaken by different agencies whenever possible;
- Funding for the health services provided through home care should remain a government responsibility;
- Funding for homemaking services should be a shared government responsibility but with the provision for program users to pay according to their ability.
- Participation of volunteers in providing services to the home care program is essential and must be vigorously promoted.

In order to implement these recommendations, a new home care co-ordinating agency is to be established, under the aegis of the Department of Social Services with representation from the Departments of Health, Housing and Municipal Affairs. A provincial co-ordinator and seven field representatives will be appointed, and there will be an advisory committee composed of professional organizations, homemakers agencies, volunteer, church and client groups, and the Royal Canadian Legion.

The report states, that it is essential that sufficient time be allowed for program implementation. The provincial coordinator and field representatives should have a reasonable period of time to arrange for coordination of services, negotiate with agencies whose services are to be included in the program, and resolve

the numerous issues which will arise during this process. During this time, existing services would be extended to those areas not currently serviced. The additional cost during this year of operation will be approximately 800 thousand dollars, over and above a base budget of \$1.8 million. Next fiscal year the program will cost in excess of \$5 million, an increase of \$2.4 million over 1986-87.

Elements of an implementation plan have been outlined as follows:

- Establish the provincial home care agency, the implementation support structure and the home care advisory committee;
- In consultation with existing local agencies and volunteer groups, identify the available services to be included in the program in each area of the province;
- Consult with the appropriate government departments and the municipalities to provide homemaking services in municipalities where these services currently do not exist;
- Consult with the municipalities and existing homemaker, nursing and volunteer agencies to establish the working arrangements for the home care program;
- Develop policies, standards and procedures in consultation with the relevant agencies to ensure that quality standardized services are available province-wide;
- Develop the procedures and forms of assessment;
- In cooperation with the homemakers' agencies, develop a fee structure for the homemakers services provided by the home care program.

A fundamental element of the program will be the provision of a highly visible access point to available home care services so that concerned Nova Scotians can contact the recognized, local agency for assessment and referral directly to the home care services available in the community. It is stated that approximately 18,000 eligible Nova Scotians will eventually take advantage of the home care program annually. A majority will be senior citizens but some will be disabled Nova Scotians or families at risk.

#### Commentary

Nova Scotia's Coordinated Home Care Program has been slow coming, but brings this province more into line with similar policies and programs long established elsewhere in Canada. It is relevant to note that the Nova Scotia Legislative Select Committee on Health (1984) reported that more recommendations were made to the Select Committee regarding the

development of a home care program in Nova Scotia than for any other specific type of program.<sup>3</sup> This can be taken as clear evidence of public demand. According to the Deputy Ministers Report, co-ordinated home care programs exist in all other jurisdictions of Canada, except the Yukon. The characteristics of each program differ with regard to client group, range of services provided and other features. None of the programs charges for medical services, although in some cases, charges exist for homemaker and other services.

The proposed Nova Scotia program will be quite limited in the foreseeable future and will commence with a legacy of previously unco-ordinated services that developed in an ad hoc manner. If the co-ordinated program is to become effective and efficient in the longer term, specific goals and operational objectives will have to be developed.

Its location in the Department of Social Services means that the program will be directed towards those with unusual need, unlike the health service model which would require greater recognition of the principle of universal access. Some form of means testing is implied and user charges can be expected for some services. Also, it is not clear just how well the program will be suited to the full range of disabling conditions. While the focus is clearly on chronic disability among the elderly, there is the question as to how particular groups may be managed (e.g., the mentally ill). While the focus on the upper end of the age spectrum is an appropriate political response to the demographic imperative of an ageing population, there is no reference to the home care needs of younger individuals (e.g., children) for whom more coordinated and accessible home care would be beneficial.

Although the program has been announced in a political environment, it is important that the development of the program be governed by health principles. To ensure this, the Advisory Committee must be broadly based and have substantial expertise in community health. Ultimately the program must respond to the three national health challenges recently outlined by the federal Minister of Health and Welfare, the Honorable Jake Epp: reducing inequities, widening the prevention effort, and enhancing people's capacity to cope.<sup>4</sup>

Whether the new coordinated home care program will be, on balance, cost-generating or cost-saving is uncertain. Home care services, which are strictly complements to (rather than substitutes for) services already offered, will add to total costs. These must

be justified on their own merits. Other home care services, which are substitutes for equivalent but more expensive services offered through departments of health, social services, housing and municipal affairs, offer the potential for reducing total system-wide costs. Total costs of these other programs must fall if additional expenses for home care are to be more than offset. Are these potential savings likely to be realized? Evidence from other jurisdictions in Canada and abroad is equivocal.

Supporters of home care programs contend that savings will occur eventually through foregone construction of new hospital and nursing home beds. What is clear, though, is that home care programs do not automatically generate cost-savings elsewhere in the system. Capturing potential savings requires a concerted effort, and a mechanism for doing so. It requires development of sensitive assessment instruments to determine a person's or family's need for particular types of home care, the expected benefits, and the optimum duration of service. It requires systematic evaluation of various components of the home care program and its impact on other government services, to identify where cost savings may be realized.

Political will is needed to capture savings. Capturing those savings will require ongoing cooperation among provincial government departments, health and social service providers, municipal governments and volunteer organizations. Savings ultimately must be captured through the judicious trimming, or the restrained growth, of those services now offered elsewhere in the system, which can be provided more cost-effectively through a home care program.

Still, these are issues of implementation, and are the stuff of future debate. At this stage it is appropriate to acknowledge the contribution of the many concerned individuals, groups and organizations whose submissions created the political environment for this program, and the Government of Nova Scotia for taking this decision which is clearly in the public interest. □

#### References

1. Statement by the Honorable John M. Buchanan, Nova Scotia House of Assembly, Halifax, June 24, 1987.
2. Report of the Deputy Ministers of Health, Housing, Social Services on Co-ordinated Home Care — Executive Summary, April 1987.
3. Report of the Nova Scotia Legislative Select Committee on Health, Volume I, Halifax, 1984.
4. *Achieving Health For All: A framework for health promotion*, released by the Honorable Jake Epp, Ottawa, November, 1986.

---

"Knowledge makes one arrogant; education makes one humble."

— Hans G. Creutzfeldt (1885-1964)

# Predictors of Vertebral Bone Density in Nova Scotian Females

## A REVIEW OF RISK FACTORS

David Hogan,\* M.D., F.R.C.P. and Susan Whiting,\*\* Ph.D.,

Halifax, N.S.

A number of historical risk factors for the development of osteoporosis have been proposed in the literature. We performed vertebral bone densities on 41 Nova Scotian females, ranging in age from 20 to 73, who were apparently healthy and had not suffered any of the typical osteoporotic skeletal fractures. We investigated the relationship between the bone density and suspected risk factors for the development of osteoporosis. These included increasing age, menopausal status, positive family history, short stature/leanness, low calcium intake, inactivity, smoking, and alcohol use. With regards to calcium intake, we evaluated both present calcium intake and reported childhood intake of calcium. The only significant ( $P < 0.05$ ) predictors of vertebral bone density were age, height, and weight. At least in our small study, there was no striking relationship between bone density determinations and the presence or absence of some of the reported risk factors — in particular, calcium intake.

Osteoporosis is a major public health problem, and is stated to affect one female in three over the age of 65.<sup>1</sup> This condition can be definitively stated to be present if an individual has one of the typical osteoporotic fractures (Colles' fracture, proximal hip fracture, and/or vertebral compression fracture) accompanied by an absolute decrease in the amount of bone.<sup>1</sup>

It has only recently become practical to measure bone density,<sup>2</sup> for standard radiographs are imprecise and insensitive. Two techniques have become particularly prevalent for the measurement of bone density — dual photon absorptiometry and quantitative computed tomography. Both techniques have their proponents with both techniques being acceptable for use in experimental studies. Not surprisingly, there is an association between bone density and the risk of fractures — particularly at the vertebral site.<sup>1</sup>

In the literature, there are a number of frequently reported historical risk factors for the development of

osteoporosis.<sup>1</sup> [see Table I]. It is not yet possible to weigh these factors according to relative importance. One of the most controversial topics at the present time is dietary calcium intake.

TABLE I  
MAJOR HISTORICAL RISK FACTORS FOR  
OSTEOPOROSIS IN WOMEN<sup>1</sup>

Age	Nulliparity
Post-menopausal	Gastric or Small-Bowel Resection
White or Asian	Long Term use of Anti-convulsants
Premature Menopause	Hyperparathyroidism
Positive Family History	Thyrotoxicosis
Short Stature and Small Bones	Smoking
Leanness	Heavy Alcohol Use
Low Calcium Intake	
Inactivity	

The recent intense interest in calcium began in 1984 when the National Institutes of Health Consensus Development Conference statement on osteoporosis recommended that all Americans should consume at least 1000 mg of calcium per day and that post-menopausal women should consume at least 1500 mg of calcium per day.<sup>3</sup> The suggestion was that any less calcium could lead to osteoporosis. In the United States, the sales of calcium products are expected to reach \$166,000,000/year.<sup>4</sup> Many researchers feel that the calcium advice was based on very tenuous evidence. Richard Mazess at the University of Wisconsin in Madison has been quoted as saying that calcium is the "laetrile of osteoporosis".<sup>4</sup>

We wished to examine the predictors of vertebral bone density in a group of healthy Nova Scotian females. In particular, we wanted to explore the reported historical risk factors for osteoporosis [see Table I] where possible, to determine their utility in developing a "risk profile" for females. While none of our subjects had any typical osteoporotic fracture, we felt that a low bone density may represent a pre-clinical state of the disease and as such would be a harbinger of clinical osteoporosis.

## METHODS

In August 1986, women residing in Nova Scotia over the age of 20 years were recruited by posters placed around the Halifax Metro area. All participants had the study carefully explained and provided informed

Study supported by grant from Mount Saint Vincent University.

\*Assistant Professor, Department of Medicine, Dalhousie University, Halifax, N.S.

\*\*Assistant Professor Department of Home Economics, Mount Saint Vincent University, Halifax, N.S.

consent. Ethical procedures were approved by both Mount Saint University and Camp Hill Hospital, Halifax, Nova Scotia. Volunteers completed a questionnaire and had a vertebral bone density determination by dual photon absorptiometry.

Participants were not included in the study if they had one of the typical osteoporotic fractures (hip fracture, Colles' fracture, vertebral compression fracture), or were suffering from a medical condition which in itself could lead to metabolic bone disease (renal failure, chronic liver disease, thyroid disease, parathyroid disorders, gastric surgery), or were taking medications which in themselves could lead to bone disorders (steroids, anti-convulsants).<sup>1</sup> Individuals who were heavy users of alcohol were excluded as well.

Information on age, height, weight, and family history of osteoporosis were also obtained. The questionnaire contained questions relating to lifestyle practices such as physical activity levels, smoking habits, vitamin/mineral supplementation, and medication use. Most of the remaining questions dealt with dietary intakes — in particular, calcium. Calcium intake in childhood was assessed retrospectively from responses to questions concerning frequency of milk consumption at that stage of life.<sup>5</sup> Participants were asked to report whether they drank milk with every meal, frequently but not with every meal, sometimes, or rarely/never during childhood. Current calcium intake and intake of other nutrients were estimated by a three-day food diary. Directions and examples were given with the questionnaire.

In order to obtain a consistent result, dietary data were coded and analyzed by the same individual (S.W.) Nutrient analysis of the food diary was then obtained using the Canadian Nutrient File on the V.A.X. computer at Mount Saint Vincent University. Information on present intakes of caffeine and alcohol was obtained by a beverage frequency checklist.

Vertebral bone density determinations were obtained by a dual photon absorptiometry technique. This method has good reproducibility (2-3%), accuracy (4%) and low radiation exposure (< 10 millirem).<sup>2</sup>

One-way ANOVA was used to test whether there was any difference among the 4 frequencies of milk consumption during childhood and bone density determinations corrected for age and weight. One-way ANOVA was used to test whether there were any differences in bone density amongst subjects with and without various risk fractures [see Table I]. Statistical significance was defined as a  $P < 0.05$ .

## RESULTS

See Table II for the characteristics of the study population. All subjects were caucasian and female; the mean age was 41.3 years; most were between 159 and 168 cm in height; mean weight was 61.7 kilos;

and most were pre-menopausal. A minority had a positive family history for osteoporosis which was usually defined as a family history of a typical osteoporotic fracture or the development of a Dowager's hump in an older female relative. Most claimed to exercise regularly. In contradistinction, 41% claimed to have a fairly sedentary lifestyle — at least with regards to work. Approximately 1/5 were current smokers and nearly 1/3 were consumers of alcohol. With regards to calcium intake, the mean intake at present was 854 mg/day. Most subjects appeared to be ingesting more than the recommended calcium intake for their age and sex.<sup>6</sup> Most claimed to consume milk with every meal as a child. There was no correlation between reported intake of dietary calcium as a child and present calcium intake.

TABLE II  
CHARACTERISTICS OF STUDY POPULATION

Number	41
Caucasian	100%
Female	100%
Mean Age	41.3 yrs. (Range 20-73)
Height:	
≤ 158 cm	21%
159-168 cm	55%
≥ 169 cm	24%
Mean Weight	61.7 kg (Range 47-90)
Menopausal Status:*	
Pre-menopausal	63%
Peri-menopausal	20%
Post-menopausal	17%
Positive Family History	30%
Regular Exercise	83%
Activity (usual):	
Sitting	30%
Standing	11%
Walking	38%
Active	22%
Smoker	22%
Alcohol User	32%

\* Pre-menopausal was defined as having regular menses and being less than 45 years of age. Peri-menopausal was defined as being between 45 and 55. Post-menopausal was defined as being over the age 55 and having no menses for at least 5 years.

Significant correlations between bone density and the above described factors were present only for age (increase in age was a predictor of decrease in bone density; correlation coefficient -0.408); height (increase in height was accompanied by increase in bone density; correlation coefficient 0.367); and weight (increase in weight was accompanied by increase in bone density; correlation coefficient 0.325). There were positive and significant correlations between dietary energy consumption and variables such as dietary calcium, sodium, vitamin D, and protein intakes. This indicated that as dietary energy consumption increased, intake of other nutrients from foods also increased.

## DISCUSSION

This is a relatively small study and as such it must be recognized that a significant correlation may be present which was missed because of its size. It must be recognized that the group that we looked at was not "normal" in the usual sense. This was a group of volunteers who appeared to exercise regularly, refrain from smoking/drinking, and ate well. It is probably simplistic to look for a significant effect of a single risk factor on the development of decreased bone density and/or osteoporosis. Osteoporosis in all likelihood has a complicated pathogenesis with multiple etiological factors. It is likely that the more risk factors present in a given individual, the greater the likelihood that vertebral bone density determinations will be low — a hypothesis we were not able to test in view of the size of our study. The only significant predictors that we were able to determine were age, height, and weight — a result also shown by Riggs *et al.*<sup>7</sup> One finding our study did show was that there was not a strong correlation between dietary calcium intake and vertebral bone density.

TABLE III  
CALCIUM INTAKE

Childhood Milk Intake	
Every Meal	57%
Frequently	13.5%
Sometimes	13.5%
Rarely	16%
Present Dietary Calcium Intake	
Mean Calcium Intake	854 mg/d
% of Recommended Intake	
≤ 50%	15%*
51 - 75%	15%
76 - 100%	7.5%
101 - 125%	15%
≥ 126%	47.5%

\* Percent of study group who fell within these categories.

Over the last few years, researchers have been cautious in their recommendations with regards to calcium intake for the prevention of osteoporosis.<sup>4</sup> The consensus panel's recommendations for calcium intake were derived from data reported by Heaney *et al.*<sup>8,9</sup> They estimated that calcium requirements were in the order of 1000 mg/day for pre-menopausal women and 1500 mg/day for post-menopausal women. Other researchers such as Nordin have estimated that a calcium intake of 550 mg/day was all that was required to prevent a negative calcium balance.<sup>10</sup> Determining calcium balance is fraught with many interpretational problems.

Unfortunately, the story is not much clearer when one examines the fracture rates for populations with various calcium intakes. While a Yugoslavian study showed a positive relationship between calcium intake

and bone density, numerous population studies have not shown a correlation between calcium intake and bone density or fracture rates.<sup>11,12</sup> Recent work by Riggs in which he followed a group of 107 women over an average of 4.3 years showed no apparent correlation between calcium intake and the rate of bone loss.<sup>13</sup>

At present, the weight of evidence appears to show that present calcium intake is not a strong predictor of bone density. Some investigators have tried to look at historical calcium intake during childhood, as there is some theoretical support for the concept that calcium intake in childhood and adolescence may influence peak bone mass in adulthood.<sup>5</sup> Those with a greater peak bone mass are less likely to develop osteoporosis, but this area is obviously difficult to study. What is usually attempted is an effort to estimate probable calcium intake by looking at the frequency of consumption of dairy products. We were unable to show a relationship between childhood calcium intake and bone density in our survey but again one must recognize the limitation of our numbers.

From our study, we conclude that the strongest predictors of bone density are age, height, and weight. Other historical risk factors or variables, easy to determine, do not in themselves appear to be as important in predicting bone density. In particular, this is true for historical and current calcium intake. □

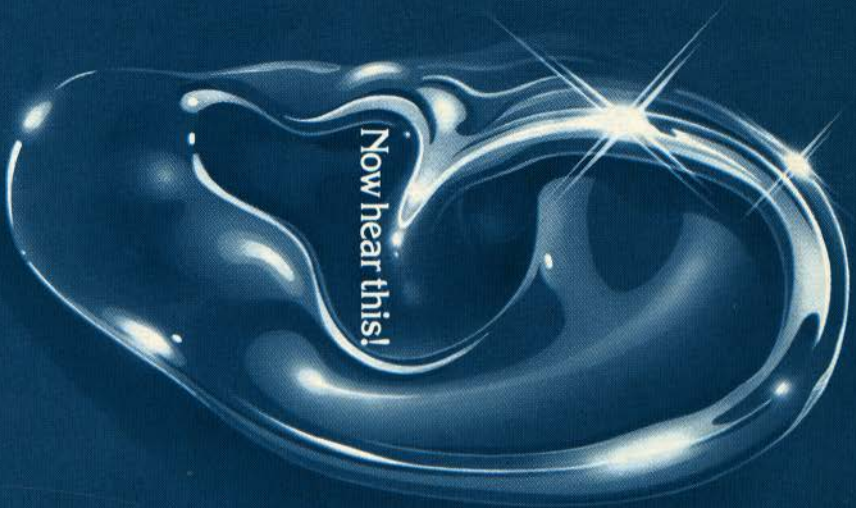
## ACKNOWLEDGEMENT

Thank you to Dr. Robert Martin, Camp Hill Hospital and Janey Hughes.

## References

1. Riggs BL, Melton LJ. Involutional osteoporosis *New Engl J Med* 1986; **314**: 1676-1686.
2. Radiologic methods to evaluate bone mineral content. *Ann Intern Med* 1984; **100**: 908-911.
3. Osteoporosis. National Institute of Health Consensus Development Conference Statement 5 (No. 3), 1984.
4. Kolata G. How important is dietary calcium in preventing Osteoporosis? *Science* 1986; **233**: 519-520.
5. Sandler RB, Slemenda CW, Laporte RE, *et al.* Post-menopausal bone density and milk consumption in childhood and adolescence. *Am J Clin Nutr* 1985; **42**: 270-274.
6. Nutrition Canada (1973) *Food consumption patterns report*. Information Canada.
7. Riggs BL, Wakner HCS, Dunn WL, *et al.* Differential changes in bone mineral density of the appendicular and axial skeletal with aging. *J Clin Invest* 1981; **67**: 328-335.
8. Heaney RP, Gallagher JC, Johnson CC, *et al.* Calcium nutrition and bone health in the elderly. *Am J Clin Nutr* 1982; **36**: 989-1013.
9. Heaney RP, Recker RR, Saville PD. Menopausal change in calcium balance performance. *J Lab Clin Med* 1978; **92**: 953-963.
10. Nordin BEC, Hasman A, Marshall DH, *et al.* Calcium requirement and calcium therapy. *Clin Orthop* 1979; **140**: 216-239.

Continued on page 132.



# Sofracort®

## A crystal clear solution for otitis externa

- Broad spectrum antibiotic.
- Anti-inflammatory/anti-pruritic.
- Soft, pliable tip designed for accurate dosing.
- Easy to use.

**134th Annual Meeting  
The Medical Society of Nova Scotia  
November 26 - 28, 1987**



# *Cryptosporidium* Today

John M. Embil,\* B.Sc. (Hon) and Juan A. Embil,\*\* M.D., Ph.D, F.R.C.P.(C), F.A.C.T.M.,

Halifax, N.S.

*Cryptosporidium* is a minute coccidian parasite which has recently started to receive attention in the literature because of clinical manifestations it may lead to in immunocompromised and acquired immune deficiency syndrome patients, as well as in children. The organism has been associated with severe watery diarrhea, anorexia, nausea, cramp-like abdominal pain, vomiting and a variety of other symptoms. Spiramycin has proven to be an effective agent for alleviating the symptoms of *Cryptosporidium* infections. *Cryptosporidium* has a worldwide distribution and has been reported in several Canadian provinces extending from Newfoundland to British Columbia.

One might say that there are but two varieties of protozoan parasites, those about which much is known and those about which little is known. Until recently, *Cryptosporidium*, first described in 1907 by Tyzzer<sup>1</sup> who detected it in the gastric glands of mice, would have been among the latter. Long a well-known cause of diarrhea in animals, it was first reported to be associated with disease in humans in 1976.<sup>2</sup> Current interest in *Cryptosporidium* has arisen from the observation that it is an important pathogen in immunocompromised patients, giving rise to a particularly severe opportunistic infection in individuals suffering from acquired immune deficiency syndrome (AIDS).<sup>3</sup> However, in patients with intact immune systems, cryptosporidiosis is either self-limited or asymptomatic.<sup>3</sup> *Cryptosporidium* infections have been reported in children attending day care centres,<sup>4</sup> <sup>5</sup> <sup>6</sup> handlers of livestock and wild animals,<sup>7</sup> as well as in humans coming in contact with infected humans and/or their feces, i.e. nurses<sup>8</sup> and other hospital workers,<sup>9</sup> or infected animals and/or their feces.<sup>5</sup> It is the aim of this communication to review what is currently known about *Cryptosporidium* with regards to the organism (morphology and classification), life cycle, clinical manifestations, diagnosis, treatment and epidemiology.

## THE ORGANISM

The genus *Cryptosporidium* consists of coccidian parasites 2 to 4  $\mu$ m in diameter and which complete their life cycle on the intestinal and respiratory

epithelial surfaces of mammals, birds and reptiles.<sup>10</sup> Although until recently human infection with this organism was thought to be uncommon and the result of a "little-known opportunistic pathogen outside of its normal host range",<sup>5</sup> this is not the case as it has been hypothesized that *Cryptosporidium* is not primarily a zoonosis as had been initially speculated.<sup>5</sup>

In 1955, Slavin associated illness with diarrhea and cryptosporidial infections in turkeys suffering from severe diarrhea.<sup>11</sup> Following this association, cryptosporidiosis has been reported in snakes,<sup>7</sup> guinea pigs,<sup>12</sup> birds,<sup>13</sup> ungulates<sup>14</sup> as well as many others. *Cryptosporidium* species belong to the family Cryptosporidiidae which in turn belongs to the suborder Eimeriina, order Eucoccidiiida, phylum Apicomplexa, and subkingdom Protozoa.<sup>7</sup> However, the taxonomy of *Cryptosporidium* is based not upon morphological, genetic or other commonly accepted classification techniques, but upon the host from which the parasite was recovered on the assumption that, like other Eimeriidae (such as *Toxoplasma gondii* and *Isospora belli*), species of *Cryptosporidium* are host specific. Evidence that *Cryptosporidium* has little or no host specificity<sup>9</sup> thus casts doubt upon its classification. As a result, it has been reported that of the 19 species of *Cryptosporidium* identified to date infecting the aforementioned organisms, only four of these species may be considered valid and the organism infecting mammals including man is *Cryptosporidium muris*.<sup>15</sup> Coccidian parasites develop and multiply within the cytoplasm of the cell; however, *Cryptosporidium* differs from typical coccidian parasites in that it is located outside the cell boundaries.<sup>10</sup>

## LIFE CYCLE

The life cycle of *Cryptosporidium*, which has been elucidated indirectly, is believed similar to that of other organisms in the class Sporozoa.<sup>7</sup> It is monoxenous, i.e. it requires one host as has been verified demonstrating that sporulated (i.e. mature and infective) oocysts have been observed in the intestinal contents of infected mice, and oocysts obtained from the feces of infected animals are immediately infective for other animals,<sup>7</sup> <sup>11</sup> with no period of incubation necessary after discharge of the oocysts in the feces. The life cycle, as understood today, is presented in a very simplified fashion as follows. The host ingests the mature and infective (i.e. sporulated) oocysts, which release their infective forms (sporozoites). These reproduce asexually yielding the active mobile feeding stage (trophozoites), which undergo nuclear divisions yielding the merozoites. The merozoites produced yield

\*Second-year medical student, Dalhousie University, Halifax, N.S.

\*\*Departments of Microbiology, Pediatrics, and Community Health and Epidemiology, Dalhousie University.

Correspondence: Dr. J.A. Embil, Infection and Immunology Research Laboratory, Izaak Walton Killam Hospital for Children, 5850 University Avenue, Halifax, N.S. B3J 3G9

the micro- and macrogametocytes which produce the micro- and macrogametes (the male and female gametes respectively). These then fuse to provide the zygote, which matures into the oocyst.<sup>10</sup>

In addition to its development having been observed on several epithelia *in vivo*, *Cryptosporidium* has been successfully grown *in vitro* on embryonic 407 intestinal cells<sup>16</sup> and on human fetal lung cells.<sup>17</sup> Results of the *in vitro* intestinal cell culture experiments suggest that the interaction of *Cryptosporidium* and the intestinal cells assists its growth and development at no expense to the cells.<sup>16</sup>

## CLINICAL MANIFESTATIONS

A *Cryptosporidium* infection may manifest itself in a number of different ways depending upon the host's species, age and immunological status as well as the time of year and geographic location.<sup>7 18</sup> It has been documented<sup>7</sup> that mice, rabbits, and other small mammals do not develop diarrhea when they become infected with *Cryptosporidium*, while larger animals such as young deer, monkeys and pigs may develop severe, watery diarrhea, anorexia, and weight loss.<sup>7 11</sup> It is interesting to note that isolates from certain animals will infect different hosts to different degrees, i.e. baby mice are less readily infected by human isolates but are more susceptible to infection by isolates from other species.<sup>9</sup> Young animals are more likely to become infected with *Cryptosporidium* as well as experiencing clinical illness, as are children.<sup>5 18</sup> It has been suggested<sup>7</sup> that, in the case of the young animals, cause of clinical manifestations may be due to a less-developed immune system while adult animals may have established immunity to *Cryptosporidium*.

Immunocompetent persons infected with *Cryptosporidium* may have no symptoms or may have a limited diarrhea which may last 1 to 10 days<sup>3 19</sup> or even up to 30 days;<sup>7</sup> however, in immunocompromised patients, such as those suffering from AIDS, a cholera-like fulminant diarrhea with severe fluid loss and malabsorption may result.<sup>19</sup> However, it has been reported<sup>20</sup> that some AIDS patients, although excreting oocysts in the stool, experience none of the typical clinical manifestations previously mentioned. It must not be assumed that *Cryptosporidium* only causes diarrhea, for it has been documented that clinical symptoms of cryptosporidiosis may also include cramp-like abdominal pain, nausea, vomiting, weight loss,<sup>21</sup> fat and carbohydrate malabsorption, protein loss, pyrexia,<sup>8</sup> laryngotracheitis,<sup>22</sup> as well as fecal water and electrolyte loss.<sup>23</sup> These symptoms, however, are not exclusive to cryptosporidiosis nor is *Cryptosporidium* only restricted to the gastrointestinal tract as it has also been identified in the respiratory tract<sup>21 23 24</sup> and sputum<sup>25 26</sup> and is possibly associated with a cough some patients have had concurrently with *Cryptosporidium* infections.<sup>6 24</sup> It has been suspected that in one case, pneumonia was caused or predisposed to by *Cryptosporidium* infection.<sup>22</sup>

## DIAGNOSIS

Initially, identification of *Cryptosporidium* as the causative agent in clinical manifestations was based upon microscopic examination of intestinal biopsies. Stool examinations were originally considered less than ideal, for the *Cryptosporidium* oocysts were either confused with yeast (common in feces) or altogether not observed.<sup>27</sup> Another drawback with fecal examination for oocysts is that oocyst shedding in feces is irregular.<sup>27</sup> Fecal examinations are, however, easier, faster, less costly and noninvasive compared to intestinal biopsies.<sup>27</sup> A "three-step" stool examination technique has been developed which consists of a preliminary differential determination with the iodine wet mount technique (oocysts appear unstained while yeast and other fecal contents stain brown), the Kinyoun acid-fast staining method (oocysts are acid fast and stain bright red; yeasts, being nonacid fast, stain green) is used for definitive identification, and Sheather's sugar coverslip flotation method for concentration of oocysts. This is followed by phase contrast microscopy with oocysts appearing as 4 to 5  $\mu$ m spherical bodies.<sup>27</sup> Yet, if a patient is not shedding oocysts, stool examination with all of its modifications is futile. The use of serological techniques such as the enzyme-linked immunosorbent assay (ELISA) has been adopted using *Cryptosporidium* oocysts as the antigen for detection of serum immunoglobulin G (IgG) or IgM to *Cryptosporidium*. The technique is very accurate and shows that both AIDS and non-AIDS patients have a serum antibody response to *Cryptosporidium*.<sup>28</sup> This technique may be used to screen for asymptomatic patients suspected of having a *Cryptosporidium* infection as well as indicating whether one has ever been in contact with the organism.

## EPIDEMIOLOGY

The prevalence of *Cryptosporidium* in Canada and the United States is not known exactly. Other data exist which gives a feeling as to its presence in various locations. Of the 92 AIDS patients reported as of June 1984, in Canada, 4 had cryptosporidiosis.<sup>29</sup> In Newfoundland and Labrador, of 1553 stool specimens representing 1317 cases of diarrhea submitted for routine examination between May and September 1984, specimens from 15 cases (1.14%) were found to contain *Cryptosporidium* oocysts.<sup>30</sup> In British Columbia, 46 out of 7300 (0.63%) patients with diarrhea were found to be shedding *Cryptosporidium* oocysts,<sup>18</sup> and another example of a Canadian report is one from Manitoba where since 1983, 2000 stool specimens were examined with the Kinyoun acid-fast stain for oocysts and has revealed 17 human cases.<sup>31</sup> In addition to the Canadian cases, many others have also been reported such as in Costa Rica, 4.3% of children hospitalized for acute diarrhea had *Cryptosporidium* oocysts in their stools,<sup>32</sup> in Australia during the four summer months, 26 of 369 (7%) hospitalized patients with gastroenteritis were shown to be excreting *Cryptosporidium*.

*poridium* oocysts while for the rest of the year, only 10 of 515 (2%) of similar patients were excreting oocysts.<sup>10</sup> Other reports include those from New Zealand,<sup>33</sup> and Madrid<sup>34</sup> to name a few. These reports all suggest the worldwide dissemination of *Cryptosporidium*.

The question of how infection occurs and spreads has not been clearly answered, and only possibilities have been suggested. A 1983 outbreak of cryptosporidiosis, among a group of Alabama animal handlers working with *Cryptosporidium* infected calves<sup>7</sup> added evidence to the idea that animals may be a source of *Cryptosporidium* infections in humans, making cryptosporidiosis a zoonotic illness. However, evidence suggests that *Cryptosporidium* should not be seen primarily as a zoonosis<sup>5</sup> (although animals undoubtedly serve as potential reservoirs of *Cryptosporidium*), as person to person transmission occurs.<sup>5</sup> Transmission of *Cryptosporidium* in humans is suspected to occur mainly by children acquiring it from other infected children, then adults acquire it while caring for the sick children, and adult-to-adult contamination ultimately occurs.<sup>5</sup> Day care centres and nursery schools often have been implicated as a major source of *Cryptosporidium* infections in children.<sup>4 5 6</sup> It has been suggested that noncontaminated children become contaminated at day care centres by coming into contact with children who have been contaminated with *Cryptosporidium* from animals or other sources.<sup>5</sup>

The fecal-oral route is presumably the major mode of transmission, as *Cryptosporidium* oocysts are almost exclusively found in feces.<sup>7</sup> This implies that transmission and subsequent infection may occur through oral-anal contact during sexual endeavors<sup>7</sup> or through contact with feces-contaminated food, water or other things that enter the mouth.

## TREATMENT

Once cryptosporidiosis has been diagnosed, what course of action exists? Coccidiostats, broad-spectrum antibiotics, antihelminths and antiprotozoan components<sup>10 35 36</sup> have been found to have little or no impact in aiding to resolve a *Cryptosporidium* infection, or remedy its clinical manifestations. However, Portnoy and associates have reported that spiramycin, a drug initially used to treat bacterial infections and toxoplasmosis, is also effective against *Cryptosporidium*; however, this report failed to include the controls used.<sup>37</sup> Yet others have also reported that

spiramycin is the only drug somewhat effective in treating cryptosporidiosis.<sup>29 38</sup> The effectiveness of spiramycin in and near the secretory tissues of the gastrointestinal tract is due to the fact that it is concentrated in the saliva.<sup>39</sup> Side effects of spiramycin treatment are not frequent although some patients have experienced nausea, vomiting, diarrhea, epigastric pain and acute colitis.<sup>35 40</sup> It has been observed that spiramycin may aid in alleviating the clinical manifestations of cryptosporidiosis, although the parasite may not be eliminated from the stool.<sup>31</sup> Spiramycin is available in Canada but not in the United States as the American Food and Drug Administration has not yet had it approved for use in humans.<sup>31</sup>

## CONCLUSIONS

Having been first identified in 1907, this extremely important protozoan parasite clearly cannot be considered a newcomer in the strictest sense of the term. It has, however, become a newcomer in the literature and the public eye, since the recent discovery that it causes fulminant diarrhea in persons who have AIDS or are otherwise immunocompromised. Although much attention has been given to the symptomatic patient suffering from cryptosporidiosis in terms of trying to eradicate the cause and remove the symptoms, little has been done in the case of the asymptomatic person, who is shedding oocysts without displaying any clinical manifestations. This poses a potential problem similar to that of carriers of the influenza virus, and the problem is further complicated in that keeping accurate track of *Cryptosporidium* infections is difficult, as it is not reported to or monitored by any agencies in Canada or the United States.

In addition to the aforementioned problem, several others still exist such as elucidating the organism's complete life cycle, determining and developing of a compound(s) which acts directly and specifically upon *Cryptosporidium* with a minimum of side effects, and perhaps developing simple and effective tests to determine whether a person is a carrier or not. But in the interim, it is suggested that all precautions normally observed when dealing with intestinal protozoan parasites be observed with cryptosporidiosis. □

References available from the Authors.

---

"No man deserves to be praised for his goodness unless he has the strength of character to be wicked. All other goodness is generally nothing but indolence or impotence of will."

— François La Rochefoucauld (1613-1680)

# Adolescent Tobacco Use in Halifax, Nova Scotia

## CHANGES SINCE 1970

Wayne Mitic,\* Ed.D., Don McGuire,\* M.A. and Brigitte Neumann,\*\* M.A.,

Halifax, N.S.

The purpose of this study is to report the changes in smoking prevalence rates at four points between 1970 and 1986 among Halifax adolescents. In the 1986 survey, about 30% of boys and 43% of girls reported that they had smoked in the past 6 months. Since 1970, the prevalence of smoking among both males and females has decreased; however, this decline has not been as great among females as it has been among males.

The use of tobacco products is widely regarded as one of the major health issues in Canada. Probably no single behavior engaged in by children and adolescents has a greater long-term impact on health than does smoking.<sup>1</sup> Despite its clear implication as a risk factor in a variety of diseases, the use of tobacco products (mostly cigarettes) among the adolescent population in Nova Scotia continues to occur at high rates.<sup>2</sup>

There are inconsistent reports in the literature concerning temporal trends in cigarette smoking among young people. Some studies indicate that there have been reductions in prevalence in recent years,<sup>3</sup> while others have shown either an increase, particularly among females<sup>4</sup> or no obvious change in rates in recent years.<sup>5</sup> Mitic and Neumann,<sup>6</sup> in 1983, reported that in Halifax, Nova Scotia, there was a general decline in the prevalence of tobacco use among adolescent boys, while rates had fallen less dramatically among girls.

The use of cross-sectional trend surveys are essential for providing sound estimates of the numbers of adolescents at risk. By monitoring the use of tobacco products among adolescents, effective directions for prevention programs can be developed. "Such trend studies provide useful information, firstly, for those who assess health care utilization, and secondly, for those who develop and evaluate the impact of educational programs."<sup>7</sup>

The purpose of this paper is to examine the changes in smoking prevalence rates at four points between 1970 and 1986 among Halifax youth.

## METHODS

The sample consisted of students enrolled in Grades 7 through 12 (ages 13 to 19 yrs.) residing in the city of Halifax, Nova Scotia who participated in a drug use survey. A systematic sampling procedure was utilized involving a random start, followed by the selection of every fifth class on a master list obtained from the school board. Because of the constant selection ratio, the sample was self-weighting. A total of 1,138 questionnaires were suitable for analysis. Similar procedures of sampling, questionnaire design and confidentiality provisions were utilized in collecting the Halifax City data on previous surveys (1970, 1976, 1983).

Second-year Dalhousie University, Health Education students were trained to administer the questionnaires on an assigned day. Respondents were given a standard explanation of the general purpose and format of the survey. No attempt was made to arrange for the administration of the questionnaire to students absent from school on that day. Teachers were not present during the administration of the survey and students were instructed not to place their names on either the questionnaire or the response sheet.

The survey questionnaire was based on that originally developed by Smart and Jackson<sup>8</sup> and modified by Neumann, Mitic and McGuire.<sup>9</sup> In order to make the Nova Scotia surveys comparable to those which might be carried out in other jurisdictions, Smart's (1985) guidelines for Canadian school surveys were closely followed in the most recent survey.<sup>10</sup>

Students' smoking was assessed by asking how often in the past 6 months they had smoked a cigarette or thin cigar. Those who responded "none" were considered non-smokers while those who smoked once a month to five per day, 6 to 20 per day, or 21 or more (a pack) a day were classified as light, medium and heavy smokers respectively. Smart *et al.* reported that the reliability and validity of drug use questions has indicated a high test-retest reliability and that the most common source of invalidity is under-reporting rather than over-reporting.<sup>7</sup> Therefore, results from surveys of this type may indicate an underestimate of actual use.

## RESULTS

Table I presents students' responses for tobacco use

\*Assistant Professor, Health Education Division, Dalhousie University, Halifax, N.S. B3H 3J5.

\*\*Co-ordinator of Research, N.S. Commission on Drug Dependency, Halifax, N.S. B3J 1H1.

in the past 6 months for the 1986 survey. Approximately 30% of boys and 43% of girls reported that they had smoked at least one cigarette during this period. While a larger proportion of boys falls in the non-smoking category at all grades except grade 7, there is no significant difference ( $p > .05$ ) between the mean number of cigarettes consumed by boys and girls in any one grade. By grade 12, male-female differences in the percentage of students in each smoking category virtually disappear.

### TRENDS IN TOBACCO USE (1970-1986)

Figure 1 presents changes in 6-month smoking prevalence for grade 7 to 12 males and females residing in Halifax for 1970, 1976, 1983, and 1986. Since the Grades 7 to 12 Survey in 1983, the percentage of students who report smoking has remained stable. No significant change was found at any grade level for either boys or girls. In 1983, 71.8 percent of males were non-smokers, compared with 69.7 percent in 1986. Also in 1983, 58.1 percent of girls were non-smokers, compared with 57.2 percent in 1986.

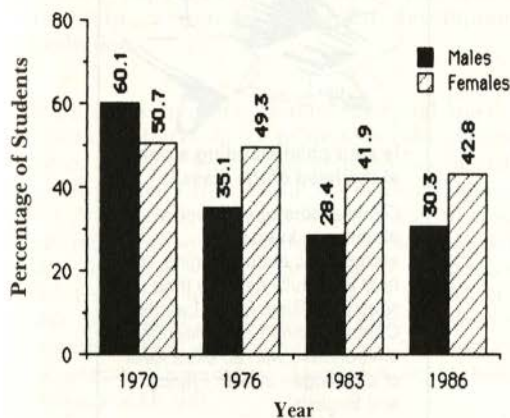


Fig. 1. Percentage of Smokers by Sex

Among boys, the sharpest drop in smoking rates since 1970 occurred between 1970 and 1976, with little reduction occurring in the past decade. Among teenage girls, smoking prevalence has declined as well. However, the decrease was not as great as that among their male counterparts: from 50.7 percent in 1970, to 42.8 percent in 1986. The prevalence of smoking among girls today appears to be about the same as it was for boys approximately 10 years ago.

### DISCUSSION

In view of the fact that smoking is a major preventable contributor to morbidity and mortality in Canada, it is imperative to have accurate estimates of smoking prevalences. While many thousands of adults,

particularly men, have successfully quit smoking in recent years, approximately 200,000 new recruits must be found each year in order for the tobacco industry to "break even." "Since 90% of smokers begin smoking before the age of 20, the main new market must be teenagers."<sup>11</sup>

TABLE I  
TOBACCO USE IN THE PAST 30 DAYS BY  
GRADE AND SEX: HALIFAX 1986

Smoking Status	Grade						Total
	7	8	9	10	11	12	
<b>Male</b>							
non-smoker	80.0	81.6	75.9	62.1	63.6	55.2	69.7
light	14.0	11.7	15.6	23.3	19.2	25.1	28.1
regular	5.0	4.9	6.0	12.6	13.1	14.6	9.4
heavy	1.0	1.9	2.4	1.9	4.0	5.2	2.7
total %	100.0	100.0	100.0	100.0	100.0	100.0	100.0
n	100	103	83	103	99	96	584
<b>Female</b>							
non-smoker	80.4	69.1	48.2	53.0	42.3	50.0	57.2
light	26.3	20.6	31.4	30.0	30.8	29.5	26.3
regular	0.0	9.3	16.9	17.0	22.1	13.7	13.7
heavy	3.3	1.0	3.6	0.0	4.8	2.7	2.7
total %	100.0	100.0	100.0	100.0	100.0	100.0	100.0
n	92	97	83	100	104	78	554

A slightly greater propensity toward tobacco use among females as opposed to males appears to persist. While non-significant ( $P > .05$ ), more females as compared with males report smoking between grades 8 to 11. By the senior grades these differences no longer appear. It would be quite erroneous to conclude that smoking in the teenage years is a significant problem only among girls.

The data presented in Table I suggest that the junior high school years are critical points for the implementation of smoking prevention and cessation programs. Few of the students surveyed were heavy smokers, using a package of cigarettes or more daily. Research by Neumann and Belzer indicates that smoking among adolescents still has social implications, as opposed to being entirely addictive in character.<sup>12</sup> For these reasons, education programs and campaigns that emphasize the addictive potential of nicotine and the unattractive features of smoking may still have a positive influence on the smoking behavior of this population. As well, smoking cessation programs may be more successful for teenagers who smoke less than more seriously addicted smokers.

A long-term perspective of the smoking prevalence rates in Halifax since 1970 provides some encouraging results. Effective smoking prevention and cessation

efforts may explain some of this decrease; however, these data must be viewed with caution. Declining smoking prevalence rates may be artifacts produced by changes in the willingness of respondents to report accurately. These might be due to changes in attitudes toward smoking or to responding to surveys over the past 16 years. Slight nuances in the wording of questions, the context in which the data was collected and differences in data analysis may contribute to the observed variance. However, even taking into account such possible errors and assuming a conservative stance in the analysis, the prevalence of tobacco use among the adolescent population should cause concern.

In recent years, the Federal Government has launched major preventive and cessation efforts focussed on adolescents in the form of the "Generation of Non-Smokers" and "Break-Free" Campaigns. As relevant as these campaigns are, little is known about their actual impact. Consequently, it may be more appropriate to incorporate such campaigns in local initiatives. The success of these can then be measured by changes in usage rates reported in the type of research presented here. Educators and health professionals can then document the impact of smoking prevention and cessation programs and appropriate modifications can be made to enhance the programs' effects. □

#### ACKNOWLEDGEMENTS

The authors wish to express their appreciation to the Nova Scotia Commission on Drug Dependency for supporting this project.

#### References

1. Millar WJ. Smoking Prevalence Among Canadian Adolescents — A Comparison of Survey Estimates. *Can J Pub Health*. 1985; **76**: 33-37.
2. Mitic WR, McGuire DP, Neumann B. Perceived Stress and Adolescents' Cigarette Use. *Psychological Reports*. 1985; **57**: 1043-48.
3. Morrison JB. Smoking Habits of Winnipeg School Students, 1960-1980. *Can Med Assoc J* 1982; **126**: 153-154.
4. Tobacco International, WHO Survey Reveals More Youths, Especially Girls, Are Smoking. *Tobacco International*. 1982; **84**: 10-13.
5. Peterson LL, et al. Prevalence of and Factors Related to Cigarette Smoking Among Students. *J Drug Education*. 1983; **13**: 305-312.
6. Mitic W, Neumann B. *Drug Use Among Halifax Adolescents - 1983*. Nova Scotia Commission on Drug Dependency. 1983.
7. Smart RG, et al. Trends in the Prevalence of Alcohol and Other Drug Use Among Ontario Students: 1977-1983. *Can J Pub Health* 1985; **76**: 157-162.
8. Smart RG, Jackson R. *A Preliminary Report on the Attitudes and Behavior of Toronto Students in Relation to Drugs*. Addiction Research Foundation. Toronto, 1968.
9. Neumann B, Mitic W, McGuire D. *Drug Use Among Halifax Secondary School Students - 1986*. Nova Scotia Commission on Drug Dependency. 1986.
10. Smart RG. *Guidelines for the Development of Canadian Surveys of Alcohol and Drug Use Among Students*. Health and Welfare Canada. Ottawa, 1985.
11. Marboro Man, R.I.P. *The Economist*, July 26, 1986; **300**: 20.
12. Neumann B, Belzer EG. *The Effects of Peer Education*. Nova Scotia Commission on Drug Dependency. 1985.

## GIFTED CHILDREN. TOO SMART FOR THEIR OWN GOOD.



Is your child standing alone,  
at the head of the class?

Gifted children need special attention to keep them enthusiastic about learning, to help them fully develop their special abilities. MAGI Learning Centres provide a rich learning environment with an extra level of challenge - in both French and English.

Our teachers are highly qualified and experienced in working with gifted children. We offer individualized programs for students from elementary through senior high school, at convenient after-school hours.

Call our Director, Vickie Johnston, for further information.



LEARNING CENTRES

Foundry Building  
958A Barrington Street  
Halifax, Nova Scotia B3H 2P7  
Telephone 420-1060

# A Maternal-Child Health Clinics Program in Honduras

J. Dobson,\* Ph.D.,

Antigonish, N.S.

The critical health care needs of women and children in rural Honduras and the response of a small group of physicians are described in this article.

Situated in 43 isolated villages, the dedicated doctors have focused their attention primarily on the health needs of disadvantaged young mothers who have a high rate of small for gestational age babies, and where it is rare that their pregnancies receive adequate antenatal care, or that they deliver in controlled settings.

The objectives of the Apostoles of Health, as the physicians are known to the villagers, is to have every pregnancy be a safe one resulting in a live birth, and have every infant reach the age of five. These objectives are being supported in Canada by Horizons of Friendship, a non-governmental development organization.

While on assignment in Honduras, Central America, for the Coady International Institute in 1985, I became involved with the health and welfare work of Sister Maria Rosa† and Father Willie Arsenault, a Canadian priest. At that time, I was introduced to a small group of doctors who were establishing a maternal-child health (MCH) clinics program to serve the needs of isolated villagers who were outside of the national health care system. On succeeding visits, I have had the opportunity to work with these young doctors and their organization called Apostoles de la Salud (Apostoles of Health).

In the space of three short years the Apostoles have grown in size from two physicians in two clinics to 43 physicians, two dentists and, just recently, 10 community nurses attending patients in 43 clinics, scattered across rural Honduras. These Hondurans, as a group, have committed themselves to working with the rural poor of their country.

During my visits I have been impressed by the dedication of these doctors and nurses as they respond, virtually alone and without adequate diagnostic equipment and medications, to the overwhelming health care needs of people who live circumstances

of extreme poverty and geographic isolation. While the MCH program focuses primarily on the critical needs of women and infants, no one in need is turned away from the clinics.

Honduras is a little-known country for most Canadians. It is a beautiful part of Central America with low mountains which extend over two-thirds of the countryside. The remaining third is a humid coastal plain facing the Caribbean Sea. This is the land of Chiquita bananas, Dole pineapples and the jungle mahogany. The beauty of the landscape, the high productivity of the large mechanized plantations and the friendly people are, however, a confusing contradiction with the struggle for survival experienced day by day by three quarters of Honduras' 4.6 million people who primarily live in rural communities.

With so many people outside the reach of urban medical care, the rural health statistics are staggering. The rural adult mortality index is 21.0 per 1000 compared with a national average of 11.8. The most prevalent causes of death between the ages of 15 and mid-adulthood, are complications during pregnancy. Virtually all mothers living outside of the urban areas are attended at birth by traditional birth attendants (TBAs).

TBAs attend to deliveries with only rudimentary empirical skills and no supervision, as there are only 1.1 doctors for every 10,000 people. Added to this difficult situation is the fact that the rural infant mortality index ranges from 98.6 to 103 per 1000, depending on the region; 70.0:1000 is the national average. The Apostoles also are faced with virtually endemic gastro-intestinal diseases and infections among children. Rural Hondurans are twice as likely to contract diseases or infections as are urban people. Consequently, the singular objective of the MCH clinics program is to lower these unacceptably high levels of morbidity and mortality in the 43 rural villages to the national average, if not below it.

I have had the opportunity to visit ten of the MCH clinics and talk first hand with the physicians, their patients and community leaders about the work of the Apostoles. There was a consistency in the comments made to me by these people. The doctors' personal objectives are clearly to save the lives of every mother and infant that is humanly possible. In their expression of commitment to their patients, these young practitioners often betrayed their frustrations at having to work without a sufficient supply of

\*Associate Professor, Department of Adult Education, St. Francis Xavier University, Antigonish, N.S.

† Sor Maria Rosa Leggol received a Doctor of Laws, *honoris causa*, from St. Francis Xavier University in 1984 for her work with orphan children, rural health care and welfare activities for the disadvantaged of Honduras.

medications and inadequate diagnostic equipment. At present, these doctors attend to the health needs of about 800 patients daily in 43 MCH clinics. The patients, usually shy women, would speak of their "mal humor" (bad spirits) and how their doctor was able to expel the malady. They would often point out that "el doctor" or "la doctora" (8 of the physicians are women) was the first medical practitioner to ever attend them. The conversation with the women would invariably turn to their children and how their doctor had saved their babies' lives. The village elders, acting as politicians do everywhere, would appear at the clinic shortly after our arrival. A few pleasantries later, they would point out that the clinic was established at their request, and that they had personally been involved in renovating the locale for the clinic which in several cases was a room in the village leader's house, for lack of other resources.

A public health promotion campaign has recently started in order to extend the services of the MCH clinics. Community nurses have begun by setting up and guiding health promotion committees made up of the villagers themselves. The committees are charged with improving both the sanitary conditions and the supply of safe drinking water in their own communities.

The doctors and nurses also are beginning to work together on the training of the TBAs in their villages. Training in hygienic and safe birthing practices, the screening and referral of potentially high risk pregnancies to the clinic, and the early identification and referral of infant abnormalities are the major recurrent themes to be presented at periodic short courses for TBAs. The Apostoles are acutely aware that in the short term the most effective way to save the lives of women and their infants in the isolated

and tradition-bound villages surrounding their clinics is to work with the TBAs on helping them improve their rudimentary birthing practices. In so doing, the Apostoles are following the guidelines set down by the Honduran Ministry of Health and the World Health Organization.

## ORGANIZATION

The MCH clinics program being carried forward in Honduras by the Apostoles de la Salud is similar in purpose in health care programs in most developing countries. The efforts of governments throughout the third world, in this regard, are now being described as a "child survival revolution" (UNICEF). Increasing the number of live births, keeping infants alive through the weaning period, and ensuring a minimum level of nutrition and hygiene through their early years are taken for granted in Canada, but are revolutionary concepts in many developing countries. We need only to look at the dismal statistics to verify that peasant-parents living in villages which adhere to traditional cultural practices have been largely unsuccessful in caring for, and nurturing their own offspring.

Development experts have recently come to realize what physicians and nurses have known for a long time, namely, that the surest way to help people break their cycle of despair and learned helplessness is to provide strong and continuous support to the health needs of mothers and children. As yet, this human change phenomenon has not been completely explained and, therefore, appears as a simplistic answer to the complex problems of development. The

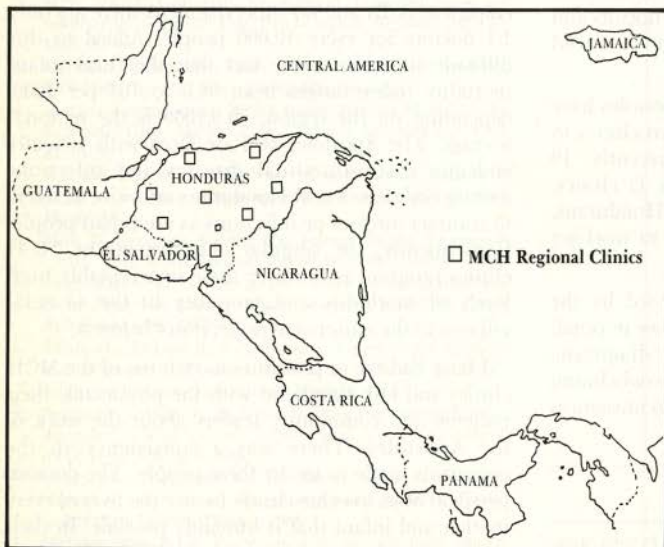


Fig. 1. A map of Central America with the MCH regional clinics identified within Honduras.



Fig. 2. Teenage mothers have a high rate of small, for gestation age, babies; yet it is rare that mothers receive antenatal care or deliver in controlled settings.



fact remains, however, that it seems to work! The Apostoles' MCH clinics program is impacting, dramatically, on the lives of people in 43 villages in Honduras.



Fig. 3. An objective of the project is to have every child reach the age of five, in a health state.

#### A CANADIAN RESPONSE

As I became increasingly involved in the work of Apostoles' MCH clinics program I also began cooperating with their Canadian sponsor, Horizons Development Agency. Horizons is committed to providing the rural clinics with financial support, equipment, and a large part of the medications they distribute free of charge to patients. Horizons as a registered charity, in turn, obtains donations from people all across Canada, as well as the Federal and Provincial Governments. Horizons is currently

negotiating a contract with CIDA-Bilateral Branch for additional support.

Although I have been involved in many Latin American development projects, the Honduran clinics project is the first time I have had the opportunity to "work" on the Canadian side of third world development. In the process, I have found that Nova Scotians are extremely generous with both their time and their resources. It seems to me that people from all walks of life are willing to lend a hand when they see a concrete way in which they can contribute time or resources to people much less privileged than themselves. For example, during the last several months a container load of hospital furnishings and equipment has been collected through the generosity of the people, hospitals and businesses of Northeast Nova Scotia.

#### POSTSCRIPT

Currently there is a Nova Scotia-wide effort to provide further resources to the Honduran clinics. In particular, there is an urgent need for medications to stock the clinics, since few Honduran peasants can afford to buy the drugs required to treat their illnesses.

Honduras is one of our closest, most needy southern neighbors and, in a medical/health care context, faces odds that even physicians in the most remote part of Canada could scarcely imagine. I would like to suggest that members of The Medical Society of Nova Scotia, as small groups or individually may want to accept the challenge of "twinning" with their Honduran medical counterparts, and assist with the provision of medications through the donation of samples, or other contributions. All cash donations are deductible for income tax purposes. Charity Registration No. 041281-09-12. □

---

"If a scientist cannot explain to the woman who is scrubbing the laboratory floor what he is doing, he does not *know* what he is doing."

— Ernest, Lord Rutherford (1871-1937)

**Financial Planning  
for the Health Professional . . .**

# Temple Cornell

**Financial Planners Ltd.**

---

**P.O. Box 2021, Station M  
Halifax, N.S., B3J 3B2  
(902) 455-0135**

# HMS *Pyramus*

## FRIGATE, RECEIVING SHIP, HOSPITAL

Ian A. Cameron,\* M.D., F.C.F.P.,

Halifax, N.S.

**Pyramus was the legendary Babylonian who committed suicide when he thought his beloved Thisbe had been devoured by a lion. Later, when Thisbe found his body, she killed herself.**

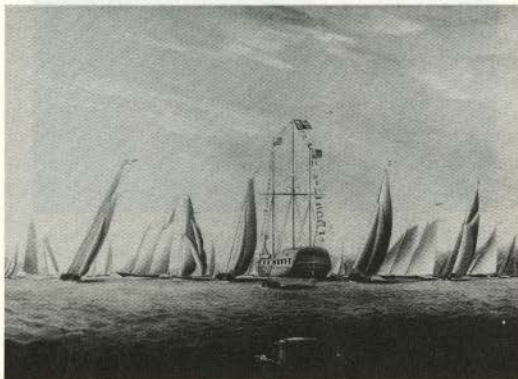
Her Majesty's Ship, *Pyramus*, was stationed in Halifax from 1832 until 1879 and became an integral part of the historical events of that period. Medically, *Pyramus* played a key role as a hospital ship in the Yellow Fever epidemic of 1861 and again in the Cholera epidemic of 1866. As the ship neared the end of its long career in Halifax harbour, it began to take on the status of a legend in its own time and romantic uncertainty shrouded its early history.

*Pyramus* was sent to Halifax as a receiving ship. These retired naval ships were located in most of the larger ports in the British Empire and their purpose was to receive recruits into the Royal Navy. They were described as being "often decrepit and foul hulks with a bad reputation." Seventeen year old Charles Reece Pemberton was impressed into the Navy at Plymouth in 1806 and gave the following description of a receiving ship. "A human washing tub on a grand scale where we were carried for the purpose of purification, fumigation, washing, scrubbing and scraping. It is a moot point whether the attempts to clean up the recruits some of whom were dirty in the extreme, were not more than cancelled out by the insanitary conditions of the ships themselves.<sup>1</sup>

The British policy of impressment flourished from the American Revolution until the end of the Napoleonic Wars. During that time as many as 130,000 seamen were required to man a navy of up to 600 ships. The usual methods of enlistment were inadequate and so forceable abduction by the notorious press gangs insured the navy of a full complement. Impressment as a policy was never abolished — it merely became less brutal and adopted different names, like conscription and National Service. Halifax has not seen press gangs since 1815 and so in all probability the function and reputation of *Pyramus* was better than its predecessors.

One of its uses was a floating hotel to quarter crews whose vessels were in port for refit. It also had a ceremonial function. On February 4, 1834 Vice Admiral The Right Honourable Sir George Cockburn

arrived in the North American Station. He was a Vice Admiral of the Blue and upon his arrival his blue flag was hoisted on his receiving ship *HMS Pyramus* in Halifax and *HMS Royal Oak* in Bermuda. (Note 1)



Halifax Yacht Club Regatta with Receiving Ship *Pyramus*, 1857 (photo of John O'Brien's oil painting owned by Salley Norwood and reproduced with permission.

The *Pyramus* had a civilian ceremonial function that the *Acadian Recorder* refers to in an article in 1857. "The Halifax Yacht Club had their opening match on the 8th of June. The *Pyramus* and the fine band of H.M. 63rd Foot had been kindly placed at the service of the Committee by the several authorities."<sup>2</sup> This event was immortalized by the young Haligonian marine artist John O'Brien in his oil painting *HYC Regatta with Receiving Ship Pyramus*. (Note 2) *Pyramus* became an integral part of the HYC's starting line. The clubs 5th rule reads: "That in every match the yachts start from the *Pyramus*. That the course for first class yachts be from the *Pyramus* inshore of the flag-boat, to be placed off the Queen's Wharf, and thence inshore of the flag boat or buoy off the Lunatic Asylum, and thence passing between the *Pyramus* and Dockyard."<sup>3</sup>

*Pyramus'* first large scale involvement as a hospital ship occurred in the summer of 1861. *HMS Firebrand* arrived in Halifax from Port Royal, Jamaica on July 4, with 79 cases of Yellow Fever on board. *Firebrand* was the first of four ships from the West Indies Squadron to arrive in Halifax that summer with Yellow Fever. Sick crewmen were transferred to *Pyramus* which was anchored at the Dockyard.

\*President, Society for the History of Medicine, Dalhousie University, Halifax, N.S.

Statistics for the epidemic were gathered by Dr. John Slayter, the Port Health Officer, and later read before the Epidemiological Society in London. Among the four ships there were 335 cases of Yellow Fever and 112 deaths, 52 of these occurring in Halifax. The Nova Scotia Medical Society debated everybody's concern: was Yellow Fever contagious? The Lieutenant Governor asked whether any society member could confirm the spread of Yellow Fever after its arrival in Halifax. The society reported that not a single case of Yellow Fever in town could be confirmed.<sup>4</sup> (Not until 1901 did Dr. Walter Reed, as director of the American Yellow Fever Commission, prove conclusively that Yellow Fever could only be transmitted by the bite of the *Aedes aegypti* mosquito.).



Receiving Ship *Pyramus* moored at Halifax Dockyard.

When not in the harbour, *Pyramus* was tied up at the Dockyard. It was moored there in September 1864 when the *Acadian Recorder* reported the following incident: "Second class officer Hilliard from the *Vesuvius* drowned having fallen in attempting to step across the *Pyramus*. He doubtless missed his footing and fell into the water. A week later he was discovered floating near the Dockyard Slip on Wednesday evening — having been brought to the surface, it is supposed, by the action of the guns fired from *HMS Duncan* on that day."<sup>5</sup> The notion that bodies could be brought to the surface by the action of guns was prevalent in the 19th century and a well known reference to this practice is mentioned in the novel *Huckleberry Finn*. Flotation resulting from gas production secondary to bacterial action as an explanation of this phenomena, would have to await the bacteriological advances at the end of the century.

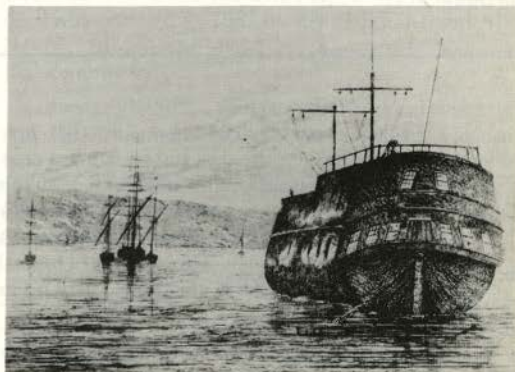
Five years later the question of contagion was again an issue of vital importance to the city. The *SS England* appeared in the mouth of Halifax Harbour on April 9, 1866 unable to continue to New York due to the ravages of an epidemic among the Irish and German immigrants on board. The Port Health Officer, Dr. John Slayter, met the ship in the outer harbour and recognized the contagious nature of the virulent

infection. He would not permit the ship to enter port and quarantined it at McNab's Island. He then requested permission from Vice Admiral Sir James Hope to use *Pyramus* as a hospital ship. It was towed down the harbour and anchored just behind the *SS England* off Findlay's Wharf. Four hundred victims of the disease were transferred to *Pyramus*.

Three days after the arrival of the *SS England*, Dr. Slayter reported to Dr. Charles Tupper, the Premier of the Province and Medical Officer for the City. "Since the removal of the healthy portion of the passengers from the ship no fresh cases have occurred. I regret to state that in the Hulk *Pyramus* which I have converted into a hospital ship the contrary has been the case. The average mortality rate is about 25 a day."<sup>6</sup> In fact there were 200 deaths in quarantine and the majority of them occurred on *Pyramus*.

After the epidemic had run its course and *Pyramus* had been cleaned and fumigated, she was towed back up the harbour to the Dockyard. The *Acadian Recorder* reported: "The *Pyramus* has been towed up to her former moorings after having been the means of invaluable service at the Quarantine Station. Could the wooden walls of the old *Pyramus* speak what a tale they might tell of sickness death suffering and misery within their sides during many years past."<sup>7</sup>

The *Canadian Illustrated News* printed an illustration of *Pyramus* with an account of its origins in its March 1, 1873 edition. The note read: "The *Pyramus* is an old teak built Danish first class 28 gun frigate that was captured with seven others by Nelson at the Battle of Copenhagen. The eight vessels were quite new at the time and lay on the stocks. They were launched by Nelson, fitted up with jury masts, and sent to England. The *Pyramus* was sent some 40 years ago to Halifax, where she now lies moored alongside one of the wharves, offering a strange contrast to the modern specimens of ship building that surround her. The hulk has been used as an Hospital ship for invalid men of war's men, also for the temporary accommodation of crews of vessels refitting in the dock yards."<sup>8</sup>



Sketch of "The Old Frigate *Pyramus*", at anchor in Halifax Harbour, *Canadian Illustrated News* 1873.

Another intriguing anecdote concerning *Pyramus* occurred in the April 1938 edition of the *Nova Scotia Medical Bulletin*. Marguerite Grant in an article on Halifax Dartmouth Hospitals refers to *Pyramus*: "a piece of this old boat in which a cannon ball is imbedded was kept as a souvenir and is now in the possession of Mrs. William McNab of 321 South Street."<sup>9</sup>

It was fascinating to think that one of Lord Nelson's prizes spent almost half a century in Halifax Harbour and that it probably had been involved in naval engagements. However the origins and early adventures of *HMS Pyramus* took a more mundane turn. J.J. Coleridges, *Ships of the Royal Navy* states: The *Pyramus* was a 5th rate 36 gun vessel, launched in Portsmouth in 1810. It served as a receiving ship in 1832 and was broken up in Halifax in 1879. The British Navy List of 1801 indicates that Nelson captured 15 Danish Ships at the Battle of Copenhagen, only one was transferred to the British Navy, the 60 gun *Holstein*. This ship would require two gun decks and would be considerably larger than *Pyramus*.

To farther clarify the origins of *Pyramus*, I contacted the National Maritime Museum in Greenwich, England. Neither the log book or the ship plans could be located and only three references to *Pyramus* could be found prior to its departure for Halifax in 1832. Admiral Suamarez mentions Captain Dashwood of *HMS Pyramus* in his 1811 despatches from the Baltic Sea. In 1813 during the British blockade of the French coast, the U.S. consul to Tunis, Mordecai Noah, was intercepted. He and his party were transferred to *HMS Pyramus* and transported to Plymouth.<sup>10</sup> The next mention of *Pyramus* was in 1826 when it towed the *HMS Tees* from Plymouth to Liverpool to serve as a floating church for the Mersey Mission to Seamen.<sup>11</sup>

*The Acadian Recorder*, reported the breaking up of *Pyramus* in June 1880. "The *Pyramus* is no more. The last rib is broken and no semblance to a vessel now remains. The hero of many fights is strown ingloriously in the shape of pieces of timber about the shore."<sup>12</sup>

Many interesting historical events surrounded *HMS Pyramus* during its long career; only in its medical role did the old ship approach the tragic proportions of the original *Pyramus*. □

## Notes

1. The boat flag of a Vice Admiral of the Blue can be seen in St. Paul's Anglican Church, Halifax. It is a replica of the flag flown by Phillip Durell, a Vice Admiral of the Blue during the capture of Québec. The tradition of the Admirals of the Red, White and Blue began during the seventeenth century with each colour representative of the three squadrons of the British fleet. Squadrons were divided into divisions, a Vice Admiral was in charge of each vanguard division and a Rear Admiral commanded each rear division. The size of individual fleets subsequently became much smaller but the nomenclature persisted until 1864 when the white ensign became the official British naval flag. The red ensign went to the merchant marine and the blue to the naval reserves.

2. The painting is currently in a private collection in Chester, Nova Scotia. A reproduction of the painting was recently on the cover of a catalogue of the works of John O'Brien compiled by Patrick Laurette of the Art Gallery of Nova Scotia.

## References

1. Uden, Grant. *A Dictionary of British Ships and Seaman*, London: Allen Lane/Kestrel Books 1980, pg. 413.
2. Public Archives of Nova Scotia (PANS): *Acadian Recorder*, Sept. 2, 1837, pg. 2
3. Laurette PC. *John O'Brien 1831-1891*, Art Gallery of Nova Scotia, pg. 33.
4. Erickson Paul A. *Yellow Fever in Halifax*. The Collections of the Royal Nova Scotia Historical Society, Vol. 42, pg. 59.
5. PANS: *Acadian Recorder*, Sept. 24, 1864.
6. PANS: M.G. 100, Vol. 224, # 4-5 S.S. England Correspondence.
7. PANS: *Acadian Recorder*, May 7, 1866.
8. *Canadian Illustrated News*, March 1, 1873.
9. Grant M. Halifax, Dartmouth Hospitals, *N.S. Med Bull*, 1938; April-May 1938, pg. 498.
10. *The Mariners Mirror*, 1973; 59: 446.
11. *The Mariners Mirror*, 1961; 47: 69.
12. PANS: *Acadian Recorder*, June 1, 1980.

---

"There is no evidence that scientists *per se* have any greater claim to wisdom than other members of society; there is, in fact, a good deal of evidence to the contrary. The view that scientists are objective, dispassionate, impartial and tolerant, is a myth. They are just as prejudiced and emotional as any other group of people, certainly in relation to matters outside their professional competence, but even in their own fields of scientific research, in relation to the views of colleagues with whom they disagree. Their power of logical thinking is also not above that of other professions. The views of the scientist, therefore, carry no greater authority in major political issues than those of non-scientists."

— Sir Ernst Boris Chain (1906-79)

# The Role of the Flexner Brothers in Medical Education\*

C.B. Stewart,\*\* O.C., M.D., Dr. P.H., F.R.C.P.C.,

Halifax, N.S.

I have always been intrigued by the Flexner Report of 1910 and its effect on the medical schools of the U.S.A. and Canada. Most writers convey the impression that medical schools were very weak during the last decade of the 1800s and early 1900s. Then came the Flexner Report of 1910. It was a bombshell which demolished the unsafe and rickety medical school structure and — presto! — a new, modern system of medical education arose. I occasionally wondered where the new builders came from, so quickly after the blast, but gave it no serious thought until recently.

I recall that, a few days after I was appointed Dean of Medicine at Dalhousie in 1954, I was visited by an elderly doctor who regaled me with a diatribe on the unfair treatment given to Dalhousie Medical School by Abraham Flexner on his survey visit in 1909 and in the Flexner Report of 1910. The visitor was still sputtering forty-four years later. He left with me a reprint of an article by Dr. D. A. Campbell, entitled "Medical Education in Nova Scotia", from the *Maritime Medical News* of July 7, 1910. It was recently republished by the Dalhousie Medical Alumni in *MeDal*. 1985-86, and I commend it to anyone who is interested.

As the new Dean I was rather busy in 1954, with several fingers plugging holes in the Dalhousie dyke, and I could not become as excited as my visitor was about the ancient history of 1910. Today ancient history occupies my full attention — of 1818 when Dalhousie University claims to have been founded; of 1868 when the Medical School began; of 1910 when Flexner blew it apart; of the 1920s when it revived; and of the 1930s when I was a medical student. Even the period 1946 to 1976, when I was personally involved, seems to the younger generation to be ancient history, since the pace of change has speeded up so enormously.

Was the system of medical education in the U.S.A. and Canada as atrociously weak in 1910, as portrayed by Abraham Flexner? By present day standards it undoubtedly was, but how should it have been rated by the standards of 1910? The well-known American historian, Barbara Tuchman says:

"History must be written in terms that were known and believed at the time, not from the perspective

of hindsight, otherwise the result will be invalid".

As I recall my years as a medical student at Dalhousie in the 1930s, I can see that there were serious defects in the educational program by present-day standards. No doubt the graduates of the 1950s, '60s and '70s have some criticisms of their education, also in the light of present-day theories and practice. The pace of change has been so phenomenal that standards for the evaluation of medical education or medical practice have to be in a constant state of evolution. And the historian who applies today's standards to medical education of 1910 or, indeed, 1930 or 1950, will be grossly unfair. However, it would be equally wrong to accept without question a single evaluator's opinion of the 1910 period without careful analysis. Thus Flexner's survey of 1909 and his block-buster report of 1910 are over-due for careful and thoughtful re-evaluation. Fortunately such a review has recently been undertaken by Kenneth Ludmerer.<sup>1</sup>

## NEW SOURCES OF INFORMATION

Who was this Abraham Flexner? How did he come to wield such immense power? How did he qualify as an expert — indeed as "The Expert" in medical education? Where did he get his education, experience and know-how? Was he, in fact, the sole architect, or even the chief architect of modern medical education in North America? Some answers came from recent books, but they also raised even more questions — an experience that is not uncommon to medical historians.

Abraham Flexner himself wrote the story of his career in 1940 under the title *I Remember*.<sup>2</sup> This was somewhat revised in 1962 by his daughters and Alan Nevin, under the title *Abraham Flexner, An Autobiography*.

James T. Flexner, a well-known American historian and one of the many biographers of George Washington, wrote *An American Saga* in 1984, the biography of his mother, Helen Thomas, and his father, Simon Flexner.<sup>3</sup> The latter was an older brother of Abraham Flexner and a renowned bacteriologist.

Then, in 1985, Kenneth M. Ludmerer published *Learning to Heal — The Development of American Medical Education*<sup>1</sup> This scholarly study threw searching light on the progressive development of medical education in the fifty years from 1860 to 1910. One of Ludmerer's conclusions is worthy of emphasis:

\*Based on a talk given before the Dalhousie History of Medicine Society, March 23, 1987.

\*\*Former Dean of Medicine, Dalhousie University, Halifax, N.S.

"The widely held view that the era of modern medical education began with the Flexner Report is a myth — one of the many myths about medical education that need to be destroyed".

## MEDICAL EDUCATION IN THE NINETEENTH CENTURY

In America the training of physicians and surgeons began with an apprenticeship system. Some of the medically trained immigrants or European-educated colonials took a young assistant, who accompanied the doctor on his house calls and received his training on a one-to-one basis. The quality of the training and the amount of practical experience varied widely. In some instances the apprentice probably spent more time currying the doctor's horse than caring for his patients, but eventually he was released on the public as a doctor. Later in the 1800s, groups of European-trained physicians began to organize medical schools in several American and Canadian cities. Some of these proprietary medical schools became affiliated with a university as its Faculty of Medicine, but the degree of university support varied widely. Most schools were semi-independent, and the whole teaching program was organized and presented by the self-appointed medical professors, and was financed solely by students. These were the "proprietary medical schools".

During the century preceding the Flexner Report of 1910, more than 467 such medical schools had been established in the U.S.A. and Canada, most of them after 1850. That compares with today's 127 schools in the U.S.A. and 16 in Canada. Some of the 467 were still-born, many lasting only a few months or a year or two. The death rate of medical schools was high. For example, in 1910 only 155 were left of the 162 that had been operating as recently as 1906. After Flexner's Report more than half of the 155 he surveyed had "gone with the wind" — the Flexner gale. By 1915 the number was reduced to 96, and this continued to decline to 76 schools by 1930. In the light of the previous experience, some of this reduction would almost certainly have occurred, as it had since 1850, but the Flexner Report is usually credited with the whole drastic reduction. In fact, from 1850 to 1910 the decrease from 467 medical schools to 155 averaged about 5 a year, and from 155 in 1910 to 76 in 1930, averaged about 4 a year. So the Flexner Report was not the sole influence, as usually suggested.

## FLEXNER'S BACKGROUND

The Flexner family appeared in Louisville, Kentucky, in the early 1860s, shortly before the American Civil War. They were impoverished, German-speaking immigrants, and the mother was the power behind the family. She had nine children, seven boys and two girls. The oldest son Jacob, or Jake, became a drug clerk, and later owned his own drugstore.

As Abraham said in his autobiography, the schools

in Louisville were bare, with no facilities or equipment — "poverty unmatched today". He spent two years in his teens as an evening assistant in a library, and read widely. At the age of eighteen he was sent to Johns Hopkins University by his oldest brother, Jake, the druggist, who had heard about this relatively new University in Baltimore from a recent graduate, named Sale, a teacher in Louisville.

Abraham had to sit entrance examinations to get into Johns Hopkins. He did not have the necessary high school certificate, but entrance examinations provided a legitimate alternative route at that time. He admits in his autobiography that he knew little Latin and even less Greek. Professor Warren told him: "Your paper shows that you do not know much Latin, but Sale says you come from a fine family, and we are going to let you in". When Abraham read the questions on the Greek paper, he went up to Professor Morris in the examination hall and said that he couldn't write the examination. Morris found he did not know even the rudiments of Greek but, after some conversation, invited him to come to his noon classes to take special tuition. Flexner must have been a very persuasive young man — and he proved he was smart. He completed the four-year course for a bachelor's degree (A.B.) in two years.

In his later surveys of medical education Flexner was completely adamant on entrance requirements. Any failure on the part of a university or medical school to abide by the letter of its published admission standards was a signal to bring down the axe. Apparently he did not remember with gratitude the lenience and, in fact, the good judgement of the professors who let him into Johns Hopkins University, when he did not meet their requirements for admission.

He returned to Louisville in 1886 to teach Latin and Greek in a private school, the subjects which had troubled him two years earlier. He had great self-confidence. He reorganized the teaching along progressive lines. He was greatly impressed by Dewey's philosophy of progressive education. He became headmaster and made a success of his school.

In 1905 he gave up teaching after 19 years and went to Harvard for post-graduate study — then to Europe, chiefly Germany. One year later he was back at Harvard, writing a book called *The American College*. In it he severely criticized the elective system, the lecture system and assistantships. He had high praise for the German educational system, which, he said, "caters to the better or best". He did not believe in wasting time on the mediocre student. He said: "The danger to democracy is that it will fail to appreciate excellence for, in very truth, an aristocracy of excellence is the truest form of democracy". This elitist philosophy permeated his later report on medical education.

Seventeen years as the headmaster of his own school and one year of post-graduate study in Germany —

and a habit of reading widely — had gained him some reputation, but he was still seeking a broader field. Shortly thereafter, he approached Dr. Henry Pritchett of the Carnegie Corporation. This was fortunate good timing on his part. The American Medical Association had just asked the Carnegie Organization for help in doing a survey of medical education. Pritchett invited Flexner to do a survey of medical schools. The latter was surprised at the request and suggested that Dr. Pritchett may have mistaken him for his brother, Simon, the bacteriologist. Pritchett said "No". He wanted an educator to look at the medical schools — an independent observer, not a physician.

## THE MEDICAL EDUCATION OF ABRAHAM'S BROTHERS

Let us go back to Louisville, and the Flexner family, and renew acquaintance with two of his five brothers, Jacob and Simon. Abraham obtained some of his knowledge of current medical education first-hand through the experience of his brothers.

Simon Flexner, who was older than Abraham, was, according to his son, Thomas, the historian: "a sullen delinquent who dropped out of school during the eighth grade, and thereafter lost job after job".<sup>3</sup> That is an unusually frank appraisal for a son to publish about his father. But then Simon got work in a drugstore, — not brother Jake's. There he found a microscope, used to examine urine specimens. He taught himself the techniques of microscopy, and became an avid observer of smaller forms of life.

A group of doctors were frequent visitors to the drugstore, using it as a kind of social center. They had organized a Medical School as well. They gave lectures for two terms, each three months in length, the same lectures in the second term as in the first. This so-called two year medical course (actually a three-month course, repeated) qualified a student for an M.D., after a nominal oral examination. It was typical of the proprietary medical schools of the day. Because the doctors liked their old crony, Simon, the drug clerk, they invited him to enroll in their school. He attended a night course in anatomy and *one* lecture in surgery, one in obstetrics and gynecology, and a few in materia medica. This "School" was affiliated with the University of Louisville, which had a charter, but no academic staff. The Medical School faculty were practising doctors who each got a share of the students' fees, — and also got referred patients from them after graduation.

Simon almost muffed his chance in the final examinations. The obstetrician examiner was doubtful. He accused Simon of not attending his lectures. Simon said he was there, but probably had not been seen. (He *had* been at one lecture). But he knew the answers to all the oral questions. Finally, Dr. Anderson, the obstetrician, gave up: "You've answered the questions, and, according to the rules, I have to

pass you, but God help you if you are ever called to treat a pregnant woman". "I'd know what to do", said Simon. "What would you do?" growled Dr. Anderson "I'd call you" said Simon. "Passed", said Dr. Anderson! Another M.D. had graduated!

After Simon passed his examinations and got his M.D., he too, like Abraham, went to John Hopkins, but to the new medical school — just about to be opened. The stated requirement for admission was a Bachelor's degree, but this Grade 8 drop-out was admitted on the strength of an M.D. from a proprietary medical school. Or was it because of the influence of his brother, the smart Hopkins graduate, Abraham? He took credit for it in his autobiography.

The illustrious Dr. William Welch came to Hopkins a few months later as the first Dean of Medicine and Professor of Pathology. Simon studied microscopy and bacteriology under him and became a world famous research scientist, for whom the Flexner Bacillus was named. He too had great ability and justified the lenience shown on admission by the Hopkins professors. It is interesting that a man with a relatively poor education to Grade 8 could be trained by Dr. Welch to become a senior research scientist. But light is also thrown on the lenient standards of admission to Johns Hopkins, held up by Brother Abraham as the pattern for all to follow without the slightest deviation.

Later, Brother Jake's drugstore failed, and he also decided to take an M.D. from his medical cronies, who had used his store as their social centre. Again, Abraham helped him to do so, in gratitude for the help Jake had earlier given him to go to Johns Hopkins for his A.B. degree. Jake was excused from most of the lectures at the Louisville Medical School, but he took a night course in anatomy. After Jacob, like Simon, had been awarded the M.D. degree, Abraham again succeeded in getting him admitted to Johns Hopkins, as he had done for Simon. Abraham says of Jake: "He became in the course of a relatively short period a prominent practitioner in Louisville".

After a successful graduation from Johns Hopkins, Abraham Flexner seems to have had no hesitation in using his own influence to get both brothers admitted to that University, but he says frankly: "He (Simon) was received in Dr. Welch's laboratory on the basis of an M.D. obtained in one of the wretched schools that flourished throughout the country, especially in Louisville and Chicago". They were "wretched", but they could be used without compunction so long as it was a Flexner who was the student, and they could be used to flout the admission standards of his model University — an interesting insight into the motives of this complex and brilliant man!

In any event, it is clear that Abraham Flexner had first-hand information on proprietary medical schools, knowledge contributed by the experience of his two brothers.

## THE FLEXNER SURVEY

I have already described how Dr. Henry Pritchett of the Carnegie Corporation invited Abraham Flexner to undertake a survey of American and Canadian Medical schools in association with Dr. M.P. Colwell, appointed by the American Medical Association. They carried out a rapid visit to every school in the U.S.A. and Canada. Most of the visits were hasty and brief. One gains the impression that Flexner could have written the report on most without seeing them. He had made up his mind early that about 31 medical schools would graduate enough doctors for the U.S.A. and Canada. He provided little evidence to back up this estimate, except to say that one doctor for a population of 2000 should suffice, as it did in Germany. He seems to have reached the dubious conclusion that, because the medical schools were good in Germany, the medical services to the population were also adequate. The universities, as he himself boasted, catered to the best students, the elite, and there is good reason to believe that medical services were available mostly to the nobility and aristocracy. Chancellor Bismarck introduced Europe's first government-financed medical service because of deficiencies in health care.

Flexner was determined that all the 31 medical schools, that he proposed to leave open, must be good schools. There would not, he believed, be enough money to elevate the less qualified university-affiliated schools, and he lumped them with the proprietary schools. Both were damned — another indication of his elitist philosophy. If it is not first rate, don't waste time on it — kill it.

It is interesting to compare the views of two writers on the character of Abraham Flexner. Alan Nevin, in the preface to the revised version of Flexner's Autobiography said he was:

"Not a loud aggressive, dominating figure — but a quiet, modest, dedicated man".

Perhaps Abraham's daughters, who sponsored the revision of *I Remember*, were looking over Nevin's shoulder. In any event, his nephew, James Thomas Flexner, had a different description of his famous uncle:

"A strong person, very generous, intensely egotistical, with a great capacity for self-deception! My belief is that he readily translates events into harmony with his own point of view and his own cogitations. He hardly even admits mistakes or failures on his own part, although finding many faults in others".

On might well ask: Are Nevins and Thomas Flexner describing the same man? From my reading, I incline toward the nephew's viewpoint.

## THE LUDMERER REVIEW

Kenneth Ludmerer presents a masterly review of the

development of medical education in the U.S.A., and shows that the major trends in modernizing the medical schools had begun in the last two decades of the nineteenth century. By 1910 these reforms were wholly accepted by *all* university-affiliated medical schools as valid goals, although not yet reached by all of them. Nevertheless there was a substantial number of first class schools, modern in every sense, although most still lacked adequate financial resources.

Up to the time of the U.S. Civil War, being a medical student in America was easy. No one worried about admission standards. Entrance requirements were lower than those of good high schools. Instruction was superficial and brief — usually two terms of 2 or 3 months. The course was of lectures only, the second term an exact duplicate of the first — the same lecturers, the same lectures. No effort whatsoever was made to introduce a logical order. The treatment of a fractured bone might precede the lecture on its anatomy. The course was really an unorganized series of lectures. Although some schools held oral examinations, the M.D. was almost automatically given, regardless of the student's performance. Ludmerer writes, "Except for the enterprising and affluent few, who could bribe patients into submitting to an examination, students would often graduate without ever having touched a patient".

Such a system of medical education has nothing to commend it, and was seriously below the standards achieved by European schools, especially in France, Germany, England and Scotland. In fact, many American and Canadian students went to Europe for their medical education. However, until the 1850s there were still many apprentice trainees and until the 1880s many graduates of proprietary medical schools, who had attended only an unorganized series of lectures and received little or no clinical experience. But, to suggest that only this unsatisfactory system existed in 1910 and was first recognized and corrected by Flexner is a myth — as Ludmerer indicates.

## PRE-FLEXNER IMPROVEMENTS

In 1800 only three medical schools had existed in the U.S.A. — Pennsylvania, Harvard and Kings. Between 1810 and 1840, twenty-six new schools were established, and from 1840 to 1876, 47 more. Most of the proprietary schools began after the mid-century. They were at first not any worse than the university schools. Both consisted of an unorganized series of lectures for 3 or 4 months of a year, repeated verbatim in a second term, and topped off with an oral examination by the lecturers. In partial extenuation, Ludmerer says "Medical knowledge was still relatively sparse and the extension of the curriculum (at that time) would have resulted primarily in teaching speculative theories that later would have to be unlearned". Learning was largely by memorization,



and unquestioning acceptance of authority was required.

The changes in medical schools had begun to occur about 1865, and there had been steady and sometimes rapid progress during the 45 years before the Flexner Report. The development of experimental medicine, about the mid-century, in France and Germany, and the high reputation of hospital-based medical schools in Britain, led American students to go to Europe for post-graduate study or for all of their medical training. They learned careful clinical observation in France, not reliance on the humoral theory or some other fixed philosophy. They learned laboratory methods and scientific reasoning in Germany. And in Britain they had practical experience in the diagnosis of disease and care of patients in hospitals — observation, reasoning and action in that order.

In the second half of the nineteenth century some American medical schools began to introduce laboratory teaching, first in Anatomy and Physiology, then practical hospital work for at least some students. "Students were expected to be active participants in their learning process".

Medical teachers receive little credit for pioneering modern methods of education, but they began advocating these concepts a generation before leaders of elementary and high schools did — so called progressive education. Abraham Flexner had been one of the first to apply these new methods successfully in his private school, but his assumption that medical schools in 1910 should follow a similar pattern was a generation behind the times. They already had accepted — in fact, had pioneered — these methods before Dewey or Flexner.

Ludmerer also provides information to counter the accusation of greed, so often made by sociologists and some historians including Hamowy.<sup>4</sup> "Popular images to the contrary, no medical professor (con men excluded) became rich from teaching, with \$250 being considered a large income for a year. Many dedicated professors made little or no money at all, choosing instead to relinquish their profits to support the work of the school". This was certainly true in the Dalhousie Medical School and Halifax Medical College from 1868 to 1910.

The first small step between the 1820s and 1860s was an extension of the course from 3 to 4 months to 6, still two terms with no logical sequence from science to practice. Again it is emphasized that this was true in the University affiliated schools as well as the proprietary ones.

The forerunner of Northwestern University began in 1859 to teach courses sequentially, and lengthened the course to two terms of five months each. Harvard, Pennsylvania and Michigan followed suit in the 1870s. As early as 1859 New Orleans had introduced a radical change in clinical teaching, assigning individual

hospital patients to students, to follow from admission to discharge. It became the best medical school in the country, but was destroyed in the Civil War.

Harvard University was one of the first to reform its Faculty of Medicine extensively. Charles Eliot, the University President, was responsible. He had a bitter fight with the medical faculty, including Oliver Wendell Holmes, the "Autocrat of the Breakfast Table". The medical faculty was not always the first to recognize the need for change, but usually, except at Harvard, they were ready before the University authorities were. The curriculum at Harvard was extended to three terms of nine months each. Subjects were arranged in logical sequence. Full-time professors were appointed on University salary. Physiology, microscopic anatomy and pathology were added to the study of anatomy. A few other universities soon followed suit. Their Presidents, like Eliot, were no longer prepared to rubber stamp degrees controlled by another body, only nominally affiliated with the university.

In 1870 the Pennsylvania Medical School had two five-month lecture courses but no laboratory work. In 1877 they dramatically changed their teaching and administrative structure, expanding to three five month terms, and adding scientific studies. Professors were placed on salary.

Michigan was next, in 1877, extending its annual sessions from 6 months to 9. In 1880 they had a three-year graded course and in 1890 four years, with scientific subjects and practical work in addition to didactic forms of teaching — a four-year medical course 20 years before Flexner. In fact, Dalhousie Medical School, founded in 1868, had extended its course to 4 years by 1888.

Johns Hopkins opened in 1893. Its main new features were that it had its own hospital; it required a Bachelor's degree for admission (except for the Flexner brothers); and students had two years in medical sciences and two clinical years in the hospital, a four-year medical course after a Bachelor's degree.

During the next 17 years, before Flexner, the Hopkins pattern was widely copied. Even the schools that could not match it in funding or in the stature of its faculty adopted its curriculum or a modification of it. University courses were required for admission, varying from 2 years to a 4 year course. Four years in medical school became standard, and even some of the proprietary medical schools had catalogue requirements that could hardly be distinguished from those of Johns Hopkins University. At the university schools there were full-time professors in the pre-clinical sciences of anatomy, physiology, pathology and micro-anatomy and, in some schools, pharmacology. Laboratory teaching and clinical experience with patients emphasized both the scientific and the practical. Students were supposed to learn to think, to evaluate, to solve problems — not simply to

memorize, although progress in this was spotty. Nevertheless, the goals of a 1910 medical school, and the administrative and educational structures, were established in the mould now called "modern" — and had been accepted by medical educators, university presidents and the senior medical organizations like the AMA. So what did the Flexner Survey achieve?

### THE FLEXNER ACHIEVEMENTS

The goals had been set, but there were many problems. Finances were inadequate even at Johns Hopkins, Harvard, Pennsylvania and the other leading centres, and were grossly inadequate in most other university medical schools and in all of the proprietary schools, which were dependent solely on student fees. Perhaps the chief value of Flexner's survey and report was the shock wave it sent through U.S.A. and Canada and the fear it induced that personal medical services were in grave danger. This helped open the purse strings of a number of men of tremendous wealth — and some would say of guilty consciences — Rockefeller, Eastman and others. But in the case of Andrew Carnegie, the Report caused a back-fire. Flexner's muck-raking — as Ludmerer describes it — gave the impression that medical schools were all in business for a profit to their owners and teachers. The tough old Scot, Carnegie, said none of his money would go to subsidize another man's business. Only after his death did university medical schools, including Dalhousie, receive Carnegie endowments.

Ludmerer concluded that Flexner's discussion on methods of medical teaching contained no new ideas. All medical schools had already accepted the principles he laid down, although there were wide differences in their success in meeting the stated goals. Without doubt, many of the proprietary schools did not do more than dress up their catalogues with the modern look. However, Flexner also placed great emphasis on admission requirements, faculty qualifications, laboratory and clinical facilities, hospital relations and medical research. He found serious inadequacies in many institutions. His greatest influence was on the requirement that an ideal medical school be properly equipped, with well-stocked laboratories, as well as having access to teaching hospitals as a right not a privilege. He also insisted on academically qualified faculty and believed that professorial research was essential.

Perhaps Abraham Flexner's chief contribution to medical education was not his Report but his skill as a fund-raiser. After his critical report he became Assistant Secretary in 1913 (later Secretary) of the General Education Board. For example, when he was asked to suggest what should be an appropriate use for one and a half million dollars of Rockefeller money, he said: "Give it to Johns Hopkins to make the clinical teachers full-time professors, not dependent on clinical earnings". The Hopkins model used by Flexner in

1910 was not, as is so often misreported, staffed by full-time clinical teachers. That came later. It was not a part of the model to which Flexner urged adherence in 1910, but was a later outcome of his influence with philanthropists in the Carnegie and Rockefeller Foundations.

Ludmerer says: "A recent widely publicized report by the President of Harvard University called Flexner the 'Father of modern medical education'. This myth, which violates all known principles of historical causation and human psychology, deserves once and for all to be destroyed".

Perhaps so — in the interest of historical accuracy. But — and it is a big "but" — there is no doubt that the nasty, hasty, poorly-researched, muck-raking Report jolted the public into a fear for the future of their medical services, pushed the slow-moving medical licensing boards into long overdue action, and the universities, including Dalhousie, Queens, Manitoba and Western Ontario into a realization that they had lent their names and reputations to a foreign body, which was not a true Faculty of Medicine but an independent affiliated group. For the schools that survived, the outcome was highly beneficial, but the mass treatment was brutal and more than half of the institutions were killed. Perhaps most deserved that fate. Certainly the proprietary medical schools did. Fortunately the state governments, the universities and the major philanthropists refused to accept Flexner's goal of reducing the number of medical schools to 31, and the ratio of physicians to population from one doctor per 550 persons to one per 2000. More reasonable goals were adopted and 76 medical schools were preserved.

### CANADIAN INVOLVEMENT

Canadians sometimes wonder why the American Medical Association and the Carnegie Corporation included Canadian medical schools in the Flexner survey. One reason was the lack of coordination at that time between the provincial licensing bodies. Health services were a provincial responsibility according to the British North America Act. There were no national standards. Sir Thomas Roddick, Professor of Surgery at McGill University (and, like John Stewart of Dalhousie, a pioneer disciple of Joseph Lister) struggled for more than a decade to get the Medical Council of Canada established. He succeeded only in 1912, and then it resulted only in a national system of licensure examinations superimposed on, but not replacing, provincial licensure. It was not until the 1940s that most Canadian medical graduates chose to take the national examinations for the L.M.C.C. The Canadian Medical Association was also very weak. In fact, it was threatened with extinction, but was revived as a result of decisions taken at the annual meeting in Halifax in 1921. In 1910 there were, therefore, no coordinating bodies in Canada with an

interest in medical education or licensure. There was no federal department until Pensions and National Health was established during World War I. Some of the medical schools were following with interest the recommendations of the American Medical Association, and some were seeking financial help from the Carnegie Corporation. It was therefore a natural development that they were included in the Flexner survey.

### PRESENT RELEVANCE OF THE FLEXNER REPORT

I have touched only a few aspects of Ludmerer's book and the others on Flexner. Let me end by referring to another article on the Flexner Report, written in 1985 by Dr. T.J. Murray.<sup>5</sup> This is an excellent description of Flexner's visit to Dalhousie. Unlike most of the uncritical or fawning eulogies of Flexner, Dr. Murray noted that considerable progress toward modernization had occurred before Flexner. However, pointing to some of the major problems facing medical schools today, Dr. Murray ended his excellent paper as follows:

"Perhaps we might pause at this moment and reflect — is it time for another Flexner".

I believe that we need a thoughtful and thorough review of medical education, but by a builder not an opinionated critic like Flexner — or by a group of builders, since no single solution or viewpoint will suffice. If we do have another Flexner, we can expect billion dollar court cases for damages, most of which will be won! It is a wonder he escaped in 1910 with only threats. I suspect that it was because he got so close to the major sources of philanthropy, the Carnegie and Rockefeller Foundations. No one dared to sue him if they were seeking funds to improve their medical school!


However, we do need a careful scrutiny of present day problems and a search for new answers. Flexner himself very sensibly and correctly said that his report could not serve as a guide indefinitely. Change would be necessary, he suggested, after the 1920s or certainly

the 1930s. A recent suggestion that Flexner's recommendations are the best blueprint for the medical school of today and tomorrow is nonsense. Even Flexner would not accept that evaluation — opinionated though he was. Medical science, post-graduate medical education and clinical practice have changed so dramatically since 1945, let alone 1910, that medical education also has to change. Fortunately it has changed and is still undergoing constant revision. □

### References

1. Kenneth M. Ludmerer. *Learning to Heal, the Development of American Medical Education*. New York: Basic Books Pub. 1985.
2. *Abraham Flexner, An Autobiography*. New York: Simon and Schuster, 1962. A revision and up-dating of Abraham Flexner's *I Remember*, 1940.
3. James Thomas Flexner: *An American Saga, the Story of Helen Thomas and Simon Flexner*, Boston-Toronto: Little Brown & Co., 1984.
4. Ronald Hamowy. *Canadian Medicine: A Study of Restricted Entry*. Toronto: Fraser Institute, 1984.
5. T.J. Murray: The Visit of Abraham Flexner to Halifax Medical College. *NS Med Bull* 1985; 64: 34-41.

*Fine Art by  
Contemporary Canadian Artists*



**Duke of Argyle Gallery**  
1572 Argyle Street  
Halifax, Nova Scotia B3J 2B3

(902) 422-6669

## CANADA'S FIRST FAMILY OF 4-WHEEL DRIVE.



Jeep<sub>2</sub> Comanche  
Shortbed Sport Truck



Jeep<sub>2</sub> Cherokee Chief



Jeep<sub>2</sub> YJ



Jeep<sub>2</sub> Wagoneer



Eagle Wagon



Jeep<sub>2</sub> Grand Wagoneer

Jeep offers you so many ways to go 2WD and 4WD. From the all-new Jeep<sub>2</sub> YJ to the new Comanche shortbed compact pickup to the luxurious Grand Wagoneer and the J10/J20 family of heavy-duty pickups. If you're thinking Jeep<sub>2</sub> quality and dependability, there's only one way to go.

### ONLY IN A JEEP

ATLANTIC AMC/JEEP/RENAULT  
2710 AGRICOLA STREET  
HALIFAX, N.S. B3K 4E1

JEEP  
TEL: 453-5337



Safety belts save lives.

# Current Topics in Community Health

Selected by: Dr. Frank M.M. White  
Department of Community Health and Epidemiology  
Dalhousie University, Halifax, N.S.

## CAPE BRETON RISK FACTOR SURVEY — A SUMMARY

Because of mounting concerns over high death rates due to cancer in industrial Cape Breton, the Nova Scotia Department of Health carried out a population survey for behavioural ("lifestyle") risk factors in that area during the late fall and early winter of 1985-86. The response to the survey was excellent (3% overall refusal rate): 1446 persons were interviewed by telephone using a technique that had been widely used for similar surveys elsewhere in North America; and, a sub-sample of 374 individuals also completed a self-administered dietary questionnaire that had been developed by the U.S. National Cancer Institute.

The survey identified a high prevalence of "lifestyle" risk factors and thus provides substantial indirect evidence for the probable etiology of the high rates of death due to heart and respiratory disease, cancer, and accidents, observed in Cape Breton. The key findings were as follows:

1. **cardiovascular disease risk factors.** The majority of men and women have a diet that has a significantly higher than recommended level of salt, cholesterol, and saturated fat, and a lower than recommended level of polyunsaturated fat; most of those above the age of 44 years are overweight, and most are not physically active.
2. **cancer, cardiovascular and respiratory disease risk factors.** A high proportion (43%) of men and women are current smokers; and half of the women (51%) between the ages of 20-34 years smoke.
3. **digestive tract cancer risk factors.** Most men and women have a dietary fiber intake that is significantly lower than the recommended amount.
4. **accident risk factors.** A high proportion (22%) of men and women have five or more alcoholic drinks on one occasion; this prevalence is even higher among men (44%), particularly young men; men also have a high prevalence (16%) of driving after drinking; however, both men and women have very high rates of reported seatbelt use (89%).

These results should provide strong motivation for individuals, community leaders, and health care providers, for developing and adopting more effective preventive strategies for improving the health of Cape Bretoners.

Source: Lavigne PM, *A Report on the Cape Breton Risk Factor Survey*. Nova Scotia Department of Health, February, 1987.

## LEADING CAUSES OF DEATH IN CANADA AND PROVINCES

### Observations on the Importance of Accidents

Ischemic heart disease, all cancer, other circulatory diseases and stroke, are the leading causes of death in Canada. Accidents other than motor vehicle accidents, homicides, and suicides, are the 5th leading cause of death in males and the 7th leading cause in females. Motor vehicle accidents and suicide are the 8th and 9th cause of death in males respectively and the 9th and 10th cause in females respectively.<sup>1</sup>

There is no error in the finding that "other accidents" outrank motor vehicle accident deaths and this has been consistent for all regions in Canada and for several years. Early in the 1970s, motor vehicle accidents may have been greater than the sum of the other parts (excluding homicide and suicide) but this is no longer the case.

In looking at the ICD 9 codes listed for other accidents, one notes many other categories of accidental death such as: railway, fires, watercraft, aircraft, falls, accidents with machinery, sports injuries, accidental ingestions, accidental poisonings, natural effects (heat, venoms), surgical or medical misadventures, therapeutic adverse reactions, capital punishment, and war. Of this list, the greatest contribution comes from falls, fires, drownings, and accidental poisonings.

The latest age-standardized mortality rates for Canada no longer list an "other accidents and poisonings" category. Data for 1984 show Nova Scotia leading the way in female deaths due to lung cancer, and asthma and emphysema (such liberation!). Nova Scotia males are ribbon winners as well at number 3 and 4 in heart disease and lung cancer respectively. Of course, most of the competition for top spots comes from the Atlantic Region. The rest of Canada has pleaded no contest (Table I).<sup>2</sup>

Motor vehicle accidents are the largest single accidental contribution to potential years of life lost (PYLL); as a categorical aggregate, however, the "other accidents and poisonings" category, excluding suicide and homicide, is higher. In 1984, there were 158,000 PYLL resulting from motor vehicle accidents and 119,000 from suicide (3); losses due to suicide have increased each decade since the 1960s.<sup>2</sup>

The most important single cause of PYLL in Canada is all cancer,<sup>4</sup> whereas motor vehicle accidents lead in the United States.<sup>5</sup> This difference is not because

TABLE I  
Age Standardized Mortality Rates, of 1984, By Province, Ages 25-74\*\*

		B.C.	ALTA	SASK.	MAN.	ONT.	QUE	NB	NS	PEI	NFLD
Ischemic Heart Disease	M	207.8	203.5	214.3	229.1	252.9	259.8	240.5	260.0	267.6 +	270.3 #
	F	64.8	64.7	57.8	78.8	87.2	89.7	104.3 #	85.2	65.0	100.8 +
Cerebrovascular Disease	M	30.0	36.2	32.2	36.5	35.8	41.8 #	34.9	34.7	31.1	39.9 +
	F	23.8	24.9	23.0	25.1	24.8	25.8 +	28.6 #	23.0	22.1	23.4
Cancer of Trachea/ Bronchus/Lung and Other	M	80.2	70.2	66.8	76.9	90.6	117.4 +	117.9 #	96.0	107.2	85.9
	F	31.2	27.4	23.1	30.9	32.4 +	28.5	22.8	37.4 #	17.5	17.7
Breast Cancer	F	36.2	34.3	32.9	39.8	43.4 +	42.4	35.4	39.7	45.2 #	36.9
Diabetes Mellitus	M	8.1	9.7	7.4	15.0	11.4	16.1	16.5 +	21.4	19.3 #	14.1
	F	6.7	5.7	7.0	10.9	9.1	11.4 +	10.3	10.4	6.6	15.1 #
Chronic Bronchitis, Emphysema and Asthma	M	23.3	28.7	24.0	18.4	24.7	33.3 #	33.2 +	28.9	25.6	43.7
	F	11.4	9.7	8.9	9.5	9.1	9.7	11.7 +	13.9 #	8.5	8.2
Cirrhosis of Liver	M	17.1	25.5 #	17.5	17.1	20.3	20.4 +	16.2	14.1	6.7	7.4
	F	8.1	11.0 +	9.6	11.2 #	8.9	7.1	5.7	6.0	6.1	3.2
Kidney Disease	M	4.5	3.6	5.6	1.1	5.7	7.4 #	4.3	5.0	4.9	6.9 +
	F	3.8	4.1	4.5 +	3.5	3.9	3.8	3.3	5.1 #	1.9	3.6
MVT Accidents	M	20.4	27.9	35.0 #	14.4	16.2	23.4	28.5	19.3	33.1 +	13.1
	F	11.0	11.7	11.3	6.2	7.3	6.6	12.0 +	11.6	16.7 #	3.1
Suicide	M	26.4	35.4 #	28.9	20.7	23.4	32.3 +	28.2	24.9	30.0	14.0
	F	7.5	13.5 #	6.3	9.1	9.6	9.7 +	4.0	2.8	7.1	1.5

# highest rate among provinces  
+ second highest rate among provinces  
\*\* from reference 2

#### References

1. Statistics Canada. Catalogue 84-203 Annual. *Causes of Death 1982*.
2. Ku P, Smith E, Mao Y: Recent Canadian Mortality Trends *Chroni Dis Can* 186; 7: 45-72.
3. Don Wigle, Laboratory Centre for Disease Control, (Personal communication), February 11, 1987.
4. Litven W, Smith E: Fewer Potential Years of Life Lost, Canada 1973 and 1983. *Chroni Dis Can* 1986; 6: 1-3.
5. Annual Summary 1984. *MMWR* 1986; 33: 118-120.

Source: Dr. Lynn McIntyre, Hospital Epidemiologist, Izaak Walton Killam Hospital for Children, Dept. of Community Health & Epidemiology, Dalhousie University.

## THE NATIONAL PROGRAM TO REDUCE TOBACCO USE

### Background

The National Program to Reduce Tobacco Use was established in the Fall of 1985 to combat the single most preventable factor related to current major health problems facing Canadians. The purpose of the Program is to unite groups in pursuing a common purpose — developing an effective, cohesive and comprehensive program to reduce tobacco use.

The current members of the Program are: Health and Welfare Canada, provincial/territorial health departments, and seven national health organizations: Canadian Cancer Society, Canadian Heart and Stroke Foundation, Canadian Lung Association, Canadian Council on Smoking and Health, Canadian Public Health Association, Canadian Medical Association and Physicians for a Smoke-Free Canada.

### Goals

1. To protect the health and rights of non-smokers
2. To help those who are non-smokers to stay smoke-free
3. To encourage and help those who want to quit smoking to do so.

### Strategies

In order to create, support and maintain an environment in which non-smoking is the expected and desired behaviour and to improve access to prevention, cessation and information resources, the following strategies are being pursued: enacting legislation and regulatory measures; improving access to information; increasing the availability of programs and services; promoting non-smoking messages; providing support for citizen groups' activities;

Continued on page 132.

# Appreciations

## DR. ARTHUR GERALD SHANE

Dr. Arthur Gerald Shane passed away on October 6, 1986 in Halifax after a lengthy illness. He was 68 years of age.

Dr. Shane was born in Yarmouth. He attended Dalhousie University and obtained a Bachelor of Science degree in 1938, and then he graduated from Dalhousie Medical School in 1942. Following his graduation he served with the Royal Canadian Army Medical Corps in World War II.

After the war ended Dr. Shane went to Birmingham, England where he pursued studies in Ophthalmology and Otolaryngology and received Diplomas in both specialties. He returned to Canada and obtained his F.R.C.S.(C) in both Ophthalmology and Otolaryngology. He was Chief of Otolaryngology at the Isaac Walton Killam Hospital for Children and at the Halifax Infirmary. He was an Associate Professor in the Faculty of Medicine, Dalhousie University.

Dr. Shane was very dedicated to his work. To further his proficiency in his specialty, he went to New York in 1958 where he studied with Dr. Lempert and learned the technique of fenestration of the ear in the treatment of deafness. He returned to Halifax and introduced this method of treatment to the province. He continued his visits to New York and developed an association with Dr. Meltzer who would keep interesting cases for these monthly visits.

He is survived by his wife Ruth, two daughters, Susan (Gaum) of St. Louis, Mo. and Wilma of Toronto, a brother Dr. Aubrey Shane, a sister Rita (Brawer) of New York, and two grandchildren.

L.R. Dayal-Gosine

---

## DR. SAMUEL MARCUS

Dr. Samuel Marcus died January 24, 1987 at the South Shore Regional Hospital after several months of declining health. He was instrumental in the construction of this hospital and chaired the opening ceremonies in 1962.

Sam was born in 1902 in Daravah, White Russia and immigrated to Sydney, Nova Scotia, when he was

seven. His father then opened a general store in Sydney Mines. Sam graduated from Sydney Mines Academy in 1918.

He received his M.D. from Dalhousie in 1925. During internship he concentrated on gynecology, urology and general surgery and had a letter of recommendation from Dr. H.B. Atlee. He decided against returning to Cape Breton due to a strike, but instead borrowed \$25.00 to do a locum for Dr. Penney in New Germany. Only 11 days later Dr. Penney died and Sam stayed on. In 1926 he published a study on diuretic use for dropsy. When Dr. Frank Davis left his practice to become Minister of Health for Nova Scotia, Sam filled the void and moved to Bridgewater in 1933. He was able to apply his surgical skills in the town's hospital. Sam practised medicine for 58 years, seeing his last patient in 1983.

He married Isabelle Carthew in 1929. She had been unable to finish her R.N. due to tuberculosis and perhaps this explained Sam's interest in public health. He was appointed Lunenburg County Health Officer in 1934 when T.B., Diphtheria, Scarlet Fever, and March-April Pneumonias were common. He became President of the Nova Scotia Branch of the Public Health Association in 1957. In 1972 he was elected Honorary Life member of the Public Health Association of Nova Scotia.

Sam was President of the Lunenburg-Queens branch of the Medical Society, a member of the Society's Executive Committee, and was on CMA council. It is a small wonder that he was elected a Senior Member of the Society in 1973.

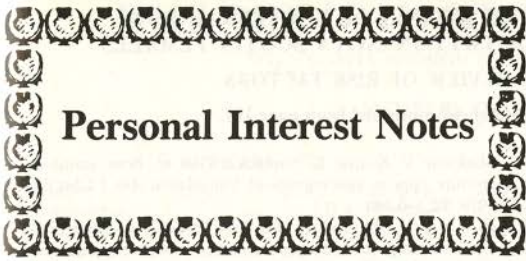
A contemporary described Sam as "a faithful friend, an industrious and capable physician, an ardent debater, and genuinely concerned about his fellow man."

His community activities included chairing the Bridgewater Board of School Commissioners, attending Masonic Lodge meetings for 60 years, being Medical Officer for the Sea Cadets, and curling (until women were permitted to join the club). He enjoyed fishing and used to attend guide meets at Lake William.

He was predeceased by his wife Isabelle and is survived by his children Barbara, John and Anne.

E.A. Morse

□



# Personal Interest Notes

## 1987 CONVOCATION DALHOUSIE UNIVERSITY FACULTY OF MEDICINE

The Dalhousie University Faculty of Medicine Convocation was held on May 22, 1987, when 98 M.D. degrees were conferred (3 in absentia). By place of residence, these graduates were from: Nova Scotia - 61; New Brunswick - 20; Prince Edward Island - 8; Quebec - 5; British Columbia - 1; United States - 2; and Finland - 1.



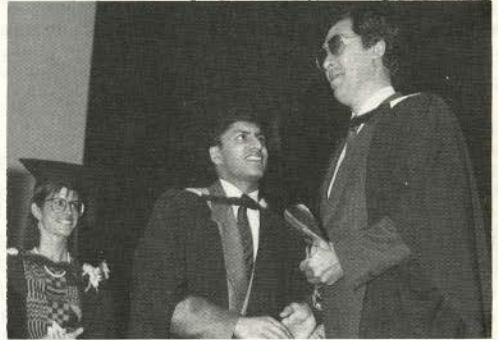
Dr. J. Donald Hill, Dr. Colleen Kelly, President Howard C. Clark and Dean T.J. ("Jock") Murray.

Dr. Colleen Mary Kelly, Bedford, Nova Scotia, was awarded the Dr. C.B. Stewart Gold Medal. An honorary degree was conferred on Dr. John Donald Hill (Dal. '60), who delivered the Convocation Address.



Dr. J. Donald Hill receiving his honorary degree from President Howard C. Clark.

Dr. William Wrixon, Professor of Obstetrics and Gynaecology, was named Professor of the Year by the Graduating Class. This award, which is a trophy in the form of a small shovel with a silver handle and inscribed blade, was presented during the convocation exercises.



Dr. William Wrixon receiving the Professor of the Year award from Class President Dr. Robert Abraham (Dr. Christina Tanner-Erjavec in the background).

Photographs by Carlos

□

## OBITUARY

**Dr. Donald M. Nicholson** (52), of Halifax, N.S. died on June 24, 1987. Born in Summerside, P.E.I. he received his medical degree from Dalhousie Medical School in 1960. He did post graduate studies in general surgery, traumatic surgery, and thoracic surgery and was chief of thoracic surgery at the Victoria General Hospital. He was a member of The Medical Society of Nova Scotia and the Canadian Medical Association, and was past president of the Section of Surgery of the Medical Society. He is survived by his wife, two daughters, and a son to whom, the Bulletin extends sincere sympathy.

## ADVERTISERS' INDEX

Atlantic AMC/Jeep/Renault .....	127
Bell and Grand Limited .....	132
David S. Green .....	132
Doane/Raymond .....	132
Duke of Argyle Gallery .....	127
Keltic Savings .....	IFC
Magi Learning Centres .....	114
Roussel Canada Inc. ....	108
Temple Cornell Financial Planners Ltd. ....	117
Classified .....	132

## CURRENT TOPICS IN COMMUNITY HEALTH

Continued from page 129.

developing and coordinating policies to support health goals; and conducting needed research.

Legislation banning tobacco advertising and promotion, the requirement for tobacco package labelling and the reporting of toxic substances directly support the goals and intended strategies of the National Program to Reduce Tobacco Use.

### Activities to-date and for the Future

The initial focus of the National Program has been youth at the vulnerable ages of 12-17 when smoking is likely to begin. Other concerns to be addressed through the Program include the increase in smoking among young women, the effects of second hand tobacco smoke on the non-smoker, the use of "smokeless" forms of tobacco, and insufficient public information on the full health effects of tobacco use and its addictiveness.

Activities undertaken in support of National Program goals will be of two types: 1) joint, national initiatives by program members, such as the "Break Free — for a New Generation of Non-Smokers" communications campaign and 2) provincial and community program initiatives specially tailored to local needs.

Additional information on initiatives to-date is available from the Tobacco Programs Unit (957-8333).

Source: Health and Welfare Canada. □

## Join the Majority Be a Non-Smoker

### FAMILY PRACTICE

Permanent: position available July 1, 1988 for a family practice on islands in Southwest Nova Scotia. Serves 1300 people in three communities. Office as well as two bedroom apartment available for rent, good ambulance service and public health nurse. Subsidy available. Hospital 60 km away in Digby. Privileges may be granted.

Contact: Freeport Village Commission, P.O. Box 31, Freeport, N.S. B0V 1B0  
or call Bob Webb (902) 839-2173.

## PREDICTORS OF VERTEBRAL BONE DENSITY IN NOVA SCOTIA FEMALES

### A REVIEW OF RISK FACTORS

References continued from page 107.

11. Matkovic V, Kostial K, Sinonovic I, *et al.* Bone status and fracture rates in two regions of Yugoslavia. *Am J Clin Nutr* 1979; 32: 540-548.
12. Cummings SR, Kelsey JL, Nevitt MC, O'Donoghue KJ. Epidemiology of osteoporosis and osteoporotic fractures. *Epidemiologic Reviews* 1985; 7: 178-208.
13. Riggs BL, Wakner HW, Melton LJ, *et al.* In women dietary calcium intake and rates of bone loss from midradius and lumbar spine are not related. *J Bone Min Res* 1986; 1 (Suppl. 1): 96 (abstract).

### Goldberg MacDonald

Barristers and Solicitors

### CIVIL LITIGATION

P.O. Box 306—Suite 1407  
Purdy's Wharf Tower  
1959 Upper Water Street  
Halifax, Canada B3J 2N7  
Telecopier 902-425-0266

Telephone 902-421-1161  
Residence 902-434-9607

David S. Green



ALFRED J.

## BELL & GRANT Limited

INSURANCE SPECIALISTS

bank of montreal tower, george street, (p.o. box 8)  
halifax, nova scotia (902) 429-4150, telex 019-21713

"INSURANCE — THAT'S ALL!"

- Business and Personal Tax Planning
- Personal Financial Planning
- Preparation of Financial Statements
- Computerized Accounting Systems

Suite 1100  
Cogswell Tower  
2000 Barrington Street  
Halifax, Nova Scotia  
(902) 421-1734

## Doane Raymond

Chartered Accountants