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GUEST EDITORIAL

The Science and Practice of Community Health

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This special issue devoted to community health reflects the diversity of this discipline. Hermann Wolf and his colleagues present the epidemiology of cardiovascular disease risk factors in Halifax County with interesting international comparisons. While we continue to be concerned about Nova Scotia smoking rates, men in Halifax County had the lowest proportion of male smokers among 34 international centres.

Ronald Gregor and his collaborators examine the prevalence of ischemic heart disease and its treatment in Halifax County. Both symptomatic and asymptomatic cases of ischemic heart disease were identified through a population-based survey. Treatment deficiencies were noted for both groups of heart patients, particularly with respect to the use of beta blockers and antiplatelet agents.

An epidemiological study of hypertension risk related to groundwater sodium consumption by Guernsey and colleagues demonstrates some of the difficulties researchers confront in conducting community-based environmental studies. Natural variations in groundwater sodium levels hampers analysis of physiological responses among exposed persons. Uneven participation among potentially exposed persons further thwarts the validity of these studies. Still, controversy surrounds the issue and physicians are left to counsel their rural patients with mild hypertension about the potential hazard of groundwater sodium without sufficient information.

John Savage and Mark Taylor discuss the role of physicians as citizens and as health advocates for health promotion and healthy public policy. The Healthy Communities Project represents the "third epidemiological revolution" in public health. While the first revolution identified principles of infectious disease control and the second revolution reexamined epidemiology in terms of chronic diseases, this third phase views health within a more comprehensive and holistic context and under the influence of public policy. Tobacco control strategy is an excellent example of success in the policy domain.

Mental health is a further dimension of community health and Alex Richman reviews advances and continuing disparities in the delivery of mental health services in Nova Scotia over a 15 year period. Rita Kamra provides a sensitive review of the mental health challenges confronting new Canadians as they adapt to our culture. Physicians who are aware of these stresses may be better able to care for their immigrant and refugee patients.

Other topics presented in this journal reflect the ever expanding field of community health — from shift work to Ben Johnson's anabolic steroid habit. The message is clear: there's a role for all physicians (and all citizens) in the improvement of the health of Canadians through the science and practice of community health. □

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Heart Disease Risk Factors in Halifax County

CONSIDERED IN AN INTERNATIONAL CONTEXT

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The population of Halifax County between 25 and 64 years of age was randomly sampled. Risk factors for heart disease were measured in the 952 persons who agreed to participate in the study (66.5% participation rate). Age-standardized values for serum cholesterol, systolic and diastolic blood pressures, body mass index (BMI), proportion of smokers, and cigarette consumption per smoker were compared with the corresponding values measured by 34 centres which participate in the WHO MONICA project. It was found that Halifax County had the lowest proportion of male smokers. Systolic and diastolic blood pressures were also among the lowest of all MONICA centres. Values for serum cholesterol, proportion of female smokers, the BMI of women, place Halifax County in the middle of the range defined by all centres. However, the female as well as male smokers of Halifax County have close to the highest daily cigarette consumption.

The mean values of risk factors in the MONICA populations were related to their respective all-cause mortality and ischemic heart disease mortality derived from official death statistics. The multivariate correlation coefficients for all-cause mortality were $r^2 = 0.53$ and 0.47 for women and men respectively. The corresponding values of ischemic heart disease were 0.36 and 0.15. In women the correlation was significantly determined by BMI and per capita cigarette consumption, whereas in men cholesterol, proportion of smokers, and diastolic blood pressure were the important factors.

It is concluded that in Halifax County population-based intervention programs focused on weight and smoking control in women and cholesterol and blood pressure control in men offer the greatest opportunities for change.

The Framingham Study has established the concept of risk factors as predictors of an individual, the probability of an event such as a stroke or death from coronary heart disease.[1] The Framingham investigators have also used this concept to estimate event rates in a population from the sum of the individual probabilities,[2] and the Pooling Project has shown that the relationship between risk factors and event rates derived in one population can be applied to other similar populations.[3] The Seven Country Study has provided further support for the risk factor concept by observing its effect in populations with significantly different event rates.[4] Since then, numerous interention trials have confirmed the close relationship between risk factors and event rates. As a result of these studies, it is now possible to predict event rates in populations with reasonable accuracy from the knowledge of the joint distribution of a few major risk factors.

The MONICA study, an international collaborative project under the sponsorship of the World Health Organization (WHO) also incorporates the risk factor concept.[5] It was designed to monitor and compare trends of cardiovascular risk factors, disease rates, and mortality in different countries. MONICA has recently published baseline data on mortality and population risk factors in these countries.[6,7] Although a comparison of baseline data between the MONICA centres was not part of the original design, the common protocol for data collection and the external quality control makes limited comparison feasible.

Halifax County is one of the two North American MONICA centres. In this report we show the ranking of the Halifax County among the other MONICA participants with regard to various cardiovascular risk factors and compare it with the ranking according to ischemic heart disease and all-cause mortality.

METHODS

Data collection

A random sample of the population of Halifax County, whose demographic characteristics are included in one of the MONICA publications, was drawn with the aim to yield about 200 participants for each sex and 10-year age group.[6] Although the sampling covered the ages of 25 to 64 years, the comparative data in this report are restricted to the 35 to 64 year range to conform with the data of the other MONICA publications. Age adjustment was computed be weighting the values for age group 34-44 with factor 12/31, those for age group 45-54 by 11/31, and the ones for age group 55-64 by 8/31. From our initial list of names we were able to locate 1432 persons, of whom 952 consented to participate in the study, yielding an average participation rate of 66.5%. The data collection took place between September 25, 1985 and November 24, 1988 and followed the MONICA protocol; it occurred either in a mobile survey unit, a suburban health care centre, or the basic science building of the Faculty of Medicine.[5] For each partici-

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pant we measured two blood pressure values in sitting position with an electronic sphygmomanometer that reduced observer bias.[8] We also collected a blood sample from the fasting participants for blood lipid analysis. The lipid laboratory was standardized by the MONICA reference centre in Prague. Smoking habit and cigarette consumption were determined by a questionnaire. Body height and body weight were measured with calibrated devices. The mortality data that are included in the MONICA publication were obtained from Statistics Canada by special request.[6] The cause of death is based on the death certificate and may be subject to the type of errors that have been identified by several investigators.[9,10] Death from ischemic heart disease is defined as having an ICD-9 death certificate code between 410 and 414. The data for the other MONICA centres were collected in similar fashion and are tabulated in published reports.[6,7]

Data Analysis

The relationship between population mortalities and population risk factors in MONICA centres was investigated with a linear regression model. Although the mortality in a population is probably more closely related to the number of persons at high risk, such as individuals with diastolic blood pressure above 95 mmHg, we used population mean values as risk indicators for reason for data availability. The choice of this proxy measure is justified since, for most risk factor distributions, there is a strong correlation between the mean values and the proportions at high risk. We were able to estimate this correlation for blood pressure distributions in the MONICA centres and found as a typical example correlation between mean systolic pressures and the proportion of the population with systolic pressure >160 mmHg as r = 0.98.

The best predictors for mortality were selected in stepwise fashion from the variables, systolic and diastolic blood pressure, serum cholesterol, body mass index, proportion of smokers in the population, daily cigarette consumption per smoker, and per capita cigarette consumption as product of number of smokers and cigarette consumption per smoker. Centres for which mortality data were missing were excluded from this analysis. If a risk factor was missing, the group mean value was used in its place for the analysis. This substitution procedure was used for eight cholesterol values and for one blood pressure value.

RESULTS

In Figure 1 we present the proportion of present and former smokers of each age group in Halifax County. For women there are only minor differences between the age groups. However, there is a clear trend in the number of men who are former smokers. Of the men between 55 and 64 years of age, 77% were smoking sometime in their life. Among the men 25 to 34 years old this proportion is only 52%. Figure 2 shows the age-standardized proportion of present smokers in the various MONICA centres. The position of the Halifax centre within this distribution is indicated by an arrow. The variability in smoking rate is much larger for women than for men. The age-standardized mean values for daily cigarette consumption by smokers, systolic and diastolic blood pressure, body mass index (BMI), and total cholesterol for the population of Halifax County are shown in relation to the range of the respective mean values of other MONICA centres in Figure 3.

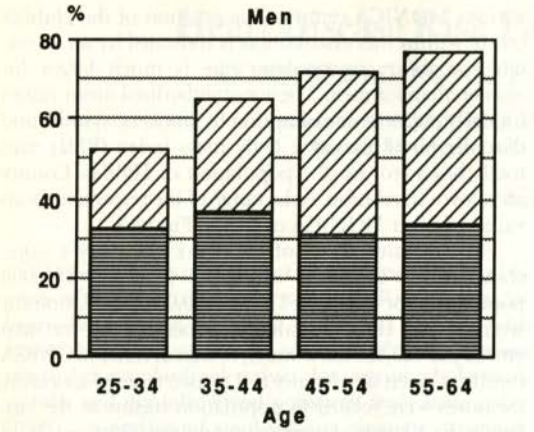
The relationship of Halifax County's age-standardized all-cause mortality (615 per 100,000 population for men and 379 per 100,000 population for women) and IHD mortality (210 per 100,000 for men and 53 per 100,000 for women) to that of other MONICA centres is given in reference 6. The two types of mortality measures were related to population means of the risk factors in a stepwise regression analysis. The results of this procedure, shown in Table I, indicate that all-cause mortality is better predicted than is IHD mortality.

TABLE I

COEFFICIENTS OF MULTIVARIATE REGRESSION MODELS FOR PREDICTION OF ALL-CAUSE AND IHD MORTALITY IN MONICA CENTRES FROM POPULATION MEAN VALUES OF SELECTED RISK FACTORS.

	Women		Men	
	All-cause	IHD	All-cause	IHD
r^2	0.53	0.36	0.47	0.15
p	0.0001	0.004	0.001	0.04
Intercept	-860	-216	-4100	-339
BMI	42.5	8.75		
Per capita cigarette consumption	38.3	9.0		
Cholesterol			238	90.7
Proportion of smokers			9.7	
DBP			36.2	

The models account for about 50% of the variance in all-cause mortality between the MONICA centres, with multiple correlation coefficients $r^2 = 0.53$ for women and $r^2 = 0.47$ for men. The correlation between risk factors and IHD mortality is still statistically significant but weaker with $r^2 = 0.36$ for women and $r^2 = 0.15$ for men. The regression coefficients represent weighting factors that indicate how a risk variable enters the regression equation to predict, together with intercept and the other factors, the mortality. They may be used to assess the relative importance of a risk factor by calculating the mortality variation caused by that risk factor's range among the MONICA centres. For example, the highest and lowest values of per capita cigarette consumption among women were 9.36 and 0.4 respectively. The predicted variation of all-cause mortality by this risk factor is therefore $38.3 \times (9.36 - 0.4) = 343$. The contribution of BMI computed in a similar fashion yields a value of 234. It indicates that per capita cigarette consumption is about 50% more important in accounting for the differences in all-cause mortality of women among



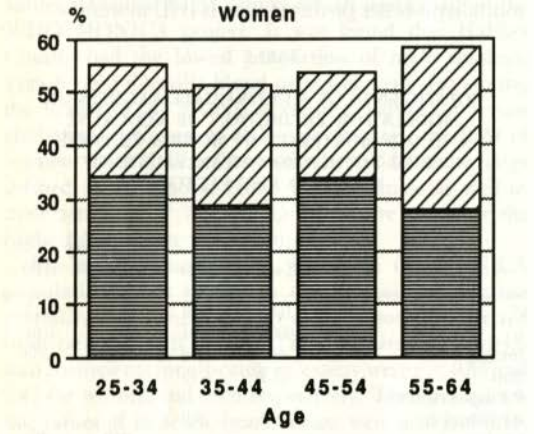
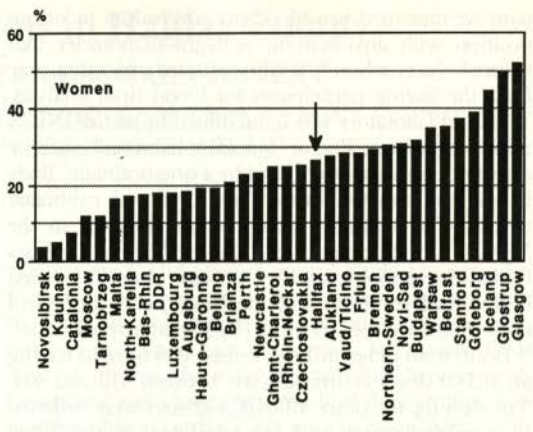


Fig. 1 The proportion of present (horizontal shading) and former (diagonal shading) male and female smokers in Halifax County per 10-year age group.



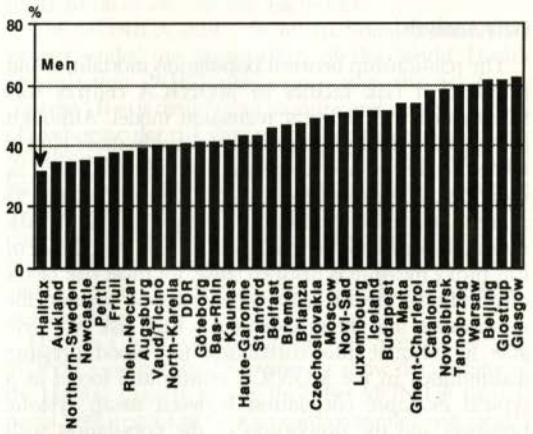


Fig. 2 The age-standardized proportion of present smokers in various MONICA centres. With the exception of the values for Halifax County, the data are based on a previous MONICA publication.[7]

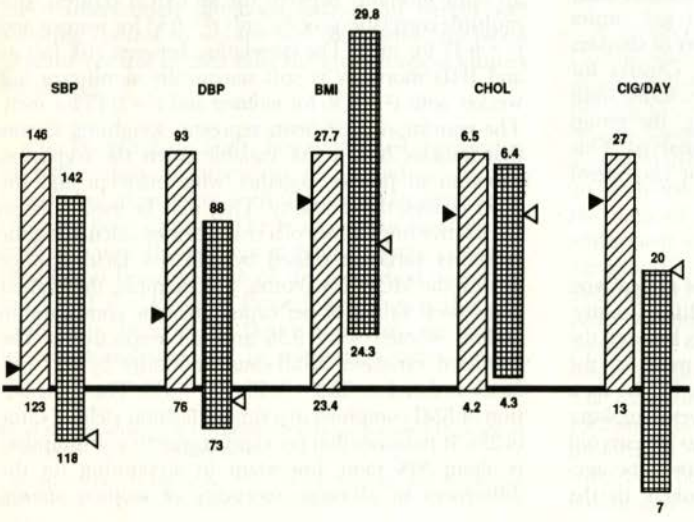


Fig. 3 The ranges of the population mean values for various heart disease risk factors among MONICA centres are presented for males (diagonal shading) and females (grid shading). Within each risk factor the position and size of the female bar is relative to the standard-size male bar. The position of Halifax County on each bar is indicated by a triangle. The numbers on either end of a bar indicate the highest and lowest values encountered among MONICA centres. The units for systolic (SBP) and diastolic (DBP) blood pressure are mmHg, for body mass index (BMI) kg/m^2, for cholesterol mM/L, and number of cigarettes per day for cigarette consumption by smokers (Cig/Day).

MONICA centres. In men diastolic blood pressure and cholesterol are about equally important in the prediction of all-cause mortality and the proportion of smokers has only about 50% of the weight of the other two factors.

DISCUSSION

The populations involved in the MONICA study offer large contrasts with respect to all the risk factors and mortalities. The more extreme example is the proportion of women smokers which has a value of 4% for Novosibirsk (USSR) and 52% for Glasgow (Scotland), a 13-fold difference. But even when the spread between centres is less pronounced, the differences are statistically quite significant; most of the other risk factors have a difference between the lowest and highest ranked centre of about 20 standard errors of the mean. The risk factor differences between centres are not only statistically significant, but they also carry a biological importance. For example, the population ranked first, according to cholesterol, has a mean value for that risk factor of 4.2 mM/L, which is far lower than the desirable goal of 5.2 mM/L recommended for Canadians; whereas the worst population's mean is 6.5 mM/L and exceeds the level that is suggested as the threshold for aggressive intervention.[11]

The position of Halifax County within this wide spectrum of risk factors shows several interesting features. Our centre has the lowest proportion of smoking men and has one of the lowest blood pressure values in men and women. BMI in women and cholesterol in men and women, positions Halifax near the centre of the distribution. However, we are among the heaviest male populations measured by the body mass index. The proportion of female smokers in Halifax is also higher than the average, the daily cigarette consumption of our smokers, male and female, is near or at the top for all MONICA centres.

There are obvious limitations in using these risk factor distributions for setting of public health policies, since they are the result of complex interactions between life styles, environments, genetic and socio-economic factors. Furthermore, most risk factors produce increased risk if they are too high as well as too low, but there is no agreement on desirable target values — not even for individual persons and much less so for populations. An exception, in this regard, is cigarette smoking where nobody debates the ultimate goal of complete elimination. While having the lowest proportion of male smokers among all the MONICA centers Halifax County therefore must continue to strive for a further decrease from the still high 30% level and also reduce the record-high cigarette consumption by our smokers.

With regard to the other risk factors, our data provide some suggestions for the scope of possible intervention programs. The multivariate regression analysis has shown that within the data limits set by the MONICA population, BMI in women, and cholesterol and diastolic blood pressure in men are linearly related to mortality. It follows that for each of these factors, the low end of the MONICA range is not so low as to cause an increase in risk and it can therefore be seen as an acceptable target value. For setting the priorities of an intervention program one can use the regression model to estimate the relative benefits that result from lowering the risk factor value in a population to the low value of the MONICA range. In the case of Halifax County such a consideration shows that in women, all-cause mortality would be lowered by 72 deaths/year if BMI would be decreased from the present 26.0 to 24.3 kg/m^2. A decrease in the per capita cigarette consumption from its present level of 5.24 to the MONICA low of 0.4 would improve all-cause mortality by 185. Smoking control therefore offers the greater opportunity to improve mortality. For men the regression model predicts that lowering of serum cholesterol from the present level of 5.9 to 4.2mM/L would reduce all-cause mortality by 405, whereas a reduction of diastolic blood pressure from the current level of 81 to 76 mmHg would improve mortality by 181. However, this comparison gives a misleading impression since the low MONICA cholesterol value of 4.2 mM/L is an isolated value. If one excludes this value as an outlier, then the MONICA range for cholesterol would be 5.4 to 6.5 and a mortality improvement for Halifax County through lowering of cholesterol in this domain would be a more realistic 119 deaths per year. In the first scenario cholesterol control would be the clear favourite, while the second scenario shows blood pressure control with a slight advantage. The final setting of priorities for intervention programs depends of course also on other factors such as intervention costs and effectiveness. However, a measure for the relative range of opportunity, as we have it illustrated for Halifax County, is an important ingredient in the decision making process.

We were surprised to find such large differences between the correlation coefficients for all-cause mortality and IHD mortality, particularly, since the risk factors had been chosen for their correlation to IHD. We do not have a definite explanation for this finding, but we speculate that in contrast to all-cause mortality the IHD mortality rates were sufficiently affected by local diagnostic practices to dilute any real correlation. It will be possible to rule out this speculation once cause of death classification, according to the standardized MONICA criteria, becomes available. The higher correlation with all-cause mortality may also be attributable to the fact that the investigated risk factors not only effect IHD deaths but are also correlated with death from cerebrovascular disease and some forms of cancer.

Even our limited analysis indicates the value of comparative risk factor surveys. They do not necessarily have to involve populations with such wide contrasts as found in the MONICA project, but regional differences as they appear to exist in Canada may already provide an opportunity for important comparisons. □

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Prevalence of Ischemic Heart Disease and its Treatment in Halifax County

RESULTS OF THE MONICA STUDY

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The Halifax County MONICA project incorporates a survey of a random sample of the population of Halifax County between 25 and 64 years of age. We used the data of this survey to estimate the prevalence of symptomatic and asymptomatic ischemic heart disease (IHD) and its treatment by perscription medication. We found that in the age group studied, 79 persons per 1,000 of the population had some marker for IHD (93 per 1,000 men, 66 per 1,000 women); and 32 of them had overt symptoms of IHD. The prevalence increases with age among men and women. Among the identified IHD patients, 80% receive cardioactive drugs, but only 44% are on beta blockers and 11% on antiplatelet agents. Both drugs are credited with improving survival of IHD patients. In each age group but especially among the elderly, there is a significant proportion of the population with signs of cardiac ischemia in their EKG who appear to be unidentified as IHD cases and who receive cardiac medication at the same low percentage as the persons with no IHD. It is concluded that medical care of IHD patients could be improved by more frequent use of β-blockers and antiplatelet agents and that the identification of symptom-free IHD cases, who are at the same risk as symptomatic ones, could be increased by more vigilant use of the EKG.

Ischemic heart disease (IHD) represents a significant social and economic burden to society. It is still the major cause of premature mortality in most industrialized populations and it results in costly acute- and chronic-care expenses. Since IHD exists without symptoms for a prolonged period of time, its true incidence or prevalence cannot be estimated easily. In its symptomatic phase it presents either as angina or as myocardial infarction with or without associated angina. The prevalence of these forms of IHD can be determined through population surveys. Despite the difficulties in measuring the prevalence of the pre-symptomatic phase, it is still very important to at least establish the number of symptomatic individuals in the population, since they can be influenced by secondary prevention measures. They are also the persons who make use of the health care resources.

The MONICA study is a project to monitor trends in morbidity, mortality and risk factors for cardiovascular disease in the community. It is conducted in Halifax County and 41 other populations in different parts of the world. Its design details have been described previously in this *Journal*.[1] Between 1985 and 1987 a survey of IHD risk factors was carried out in Halifax County, and it included a component to estimate IHD prevalence and treatment. The objective of the present study is to estimate the load of IHD in the population and to determine the frequency of pharmacological therapeutic measures used in its treatment.

METHODS

Data Collection

A random sample of the population of Halifax County between 25 and 64 years of age was selected. Of the 1425 people invited, 952 agreed to participate in the survey. Amongst questions about life style (smoking, work and leisure activity) participants were also queried about their health history. In particular, a set of questions concerning history of chest pain (Rose questionnaire) was asked.[2] If participants indicated regular use of prescription medication they were questioned about the complaints for which these medication were taken.

An electrocardiogram was recorded from all participants and coded for presence of diagnostic Q waves or other ischemic features, such as ST or T wave abnormalities. In addition, the cardiac injury score (CIIS) was calculated for each EKG.[3]

As markers for prevalence of IHD we used the items in Table I. If only CIIS $>$ 15 is present, it may be considered pre-symptomatic IHD. Although it has been shown that CIIS $>$ 10 is predictive of future IHD events, such as MI or sudden death in a group of hypertensives, we selected a more conservative value of 15 to improve specificity.[4] We define a participant with a history of MI as a person who takes medication for a previous MI, or who has diagnostic Q waves in his/her EKG. A participant with undifferentiated IHD has either a positive Rose questionnaire, or a CIIS above 15, or takes medication for IHD.

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TABLE I

MARKERS FOR IHD AS COLLECTED BY THE MONICA SURVEY EITHER THROUGH A QUESTIONNAIRE OR THE EKG.

Markers for Myocardial Infarction	Markers for Undifferentiated IHD
Hospitalization for MI	CIIS > 15
Use of prescription medication for MI	Positive Rose questionnaire for angina
Diagnostic Q waves in EKG	Prescription medication for IHD

Data Analysis

The difference in medication use between the different groups of IHD cases was tested by repeated χ^2 tests. The influence of age, gender, and IHD status on the use of prescription medication by survey participants was analyzed by logistic regression.

RESULTS

Prevalence

In Figure 1 we show the prevalence of IHD per age group for women and men. The dense shading gives the prevalence measured by the markers that were collected through interview (medication, chest pain, and hospitalization). The light shading defines the prevalence that can be identified by EKG markers only. As has been shown in many other surveys, the prevalence of IHD in men is higher than in women. The increase of prevalence with increase in age is clearly present for men. In women there are more fluctuations between age groups due to the smaller number of cases. However, an increasing trend is still noticeable. The cases that are solely defined by EKG evidence have probably not been previously identified.

Treatment

The MONICA questions concerning the regular use of prescription medication posed very little difficulty for the survey participants. Most persons had a clear understanding of the type and purpose of their medication. Only 10 persons were not quite sure why they took a particular drug and 16 other individuals could state the ailment they were experiencing but not the name of the specific medication.

Based on our survey findings we estimate that in Halifax County, 37% of women and 19% of men between the age of 25 and 64 take some kind of prescription medication. In any age group a higher percentage of women than men are regular medication users. In men and women the percentage increases with age, but in men the increase is more dramatic than in women. Among those 25 to 34 years old, only 6% of men but 30% of women, are on prescription medication. This percentage rises for the 55-64 year old men to 49%, whereas in women the increase is to 54%. The reasons for medication vary widely, but the most common are hypertension, arthritic pain, angina, and oral contraception. The use of cardioactive drugs among the survey participants is described in Table II. A relatively high usage of medication is only found among the IHD cases identified by interview. The medication use in this group is significantly different (by χ^2 test) from that in the other two groups, but the difference beween EKG-IHD patients and non-IHD patients is not significant. This supports the hypothesis that the EKG-IHD patients had probably not been previously identified.

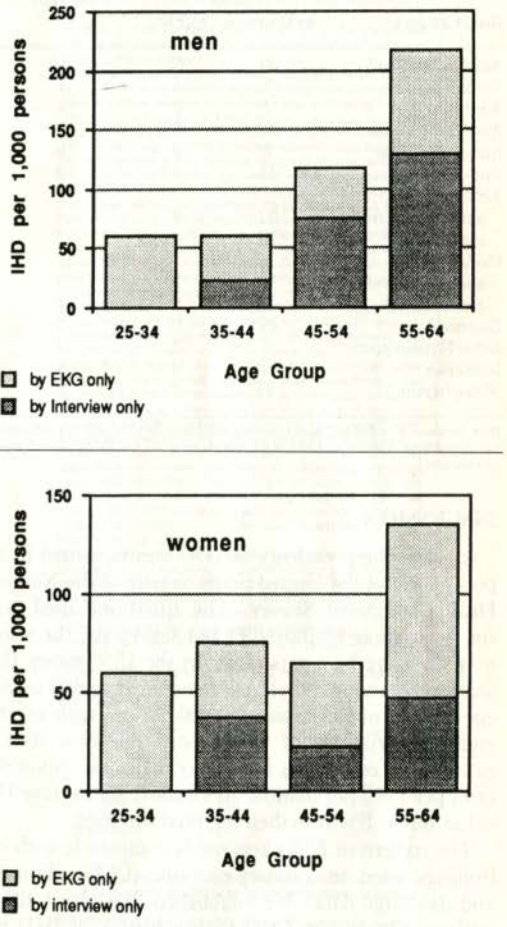

Fig. 1 Prevalence of IHD in Halifax County by gender and age when measured by interview or EKG markers.

Almost all of the IHD-by-interview participants received cardioactive drugs (80%). The most frequently prescribed drugs were β-blockers (44% for combined anti-anginal and anti-hypertensive purpose), diuretics (27%), and Ca-antagonists (24%).

In Figure 2, we show the use of any cardioactive drug in the different age groups. It indicates that even in the identified IHD patients medical treatment is relatively

uncommon in persons below 45 years of age. But in older individuals the presence of IHD definitely influences medication use. Age and IHD status, but not gender significantly infuence prescription of cardioactive medication ($p < 0.0001$ by logistic regression).

TABLE II

SURVEY PARTICIPANTS ARE GROUPED ACCORDING TO THEIR IHD STATUS. THE TABLE LISTS THE PERCENTAGE OF EACH GROUP THAT IS ON A SPECIFIED DRUG REGIMEN.

Drug Category	IHD by Interview	IHD by EKG	no IHD
Any Cardioactive*	80	26	15
Ace Inhibitors	2	6	1
Antilipids	4	0	1
Anti-Arrhythmics	2	0	0
Anti-Coagulants	2	0	0
Anti-Platelets*	11	4	3
β-Blockers			
anti-hypertensive*	22	9	4
anti-anginal*	22	4	1
Ca-Antagonists			
anti-hypertensive	4	2	1
anti-anginal*	20	0	0
Diuretics*	27	11	7
Other Hypotensives	4	2	1
Inotropics	0	4	0
Nitroglycerine*	20	0	1

Drug categories identified by * have a significant difference between interview-IHD and the two other groups. A significance level of 0.01 was chosen to account for the multiple tests on the same data

DISCUSSION

In 1986, the prevalence of IHD was measured in the population of the United States as part of the National Health Interview Survey. The questions used were similar to those employed by our survey and the results may therefore be comparable. In the U.S. survey IHD was found among individuals between 45 and 64 years of age at a rate of 59.1 cases per 1,000 persons with a ± 40% regional variation.[5] If we use our interview data to calculate an equivalent prevalence value, we obtain 65.3 cases per 1,000 population, 10.4% above the average U.S. value, but well within their regional variation.

The pattern of β-blockers use is compatible with our findings based on coronary care unit (CCU) admission and discharge data.[6] We established that about 42% of patients admitted to CCU with a history of IHD had been on β-blocker therapy prior to admission. Among the patients discharged from CCU 36.4% left with a prescription of β-blockers. Since β-blockers have been shown to improve survival after an MI[7] and also reduce mortality, if used prior to an acute event,[8] there is room for considerable improvement in the medical treatment of recognized IHD patient in Halifax County by enrolling more of them in β-blocker treatment. As sudden cardiac death may be the intitial symptomatic or clinical presentation of IHD or the mode of death in minimally symptomatic younger patients, it is a concern that the use of cardioactive medication, particularly β-blockade, is limited. The use of β-blocker therapy concomitant with intensive risk factor intervention in all individuals identified at risk for IHD should be encouraged.

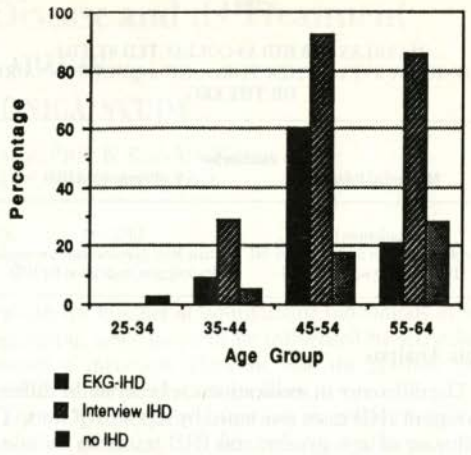

Fig. 2 Percentage of participants classified according to IHD statis who are taking cardioactive medication.

The use of anti-platelet agents in known IHD patients is surprisingly low at 11%. Again, considerable benefits may be derived from getting a higher proportion of this patient group recruited to anti-platelet therapy.

The role of the EKG as the sole indicator of the presence of IHD is rarely appreciated sufficiently. In the 45 to 64 year age group, this almost doubles the prevalence value from 65.3 to 124 cases per 1,000 population. Since only 26% of these persons receive cardioactive medication, a rate that is almost as low as in individuals without IHD, and since they are probably at elevated risk, they represent a major contributor to IHD morbidity with significant potential for preventive measures.[4] The challenge is to identify them in the large pool of persons without symptoms of IHD. We found that as a group they are slightly younger than the symptomatic IHD cases and they consist of equally men and women. Their profile of the standard cardiovascular risk factors is slightly elevated, but not enough to make the difference from the other groups statistically significant. As a consequence, there is no easy alternative to their identification by electrocardiogram.

The marked variation in regional prevalence of IHD as demonstrated in the U.S. National Health Survey probably exists in Canada also, as suggested by the mortality and risk factor distributions.[9, 10] This presents a cogent argument for careful epidemiological studies in the various regions of Nova Scotia and Canada. There is little information in the regional variations of diagnostic and therapeutic usage. Unless these data are available it is difficult to distribute the limited funds available for the health care budget most appropriately. Programs of prevention and therapy should be developed with

flexibility in such a way that regional characteristics are considered. The management of common chronic disorders such as IHD requires intense studies to determine the most efficacious approach, taking into consideration epidemiologic data, as well as diagnostic, therapeutic, and economic factors. □

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References

1. Mackenzie B, Crofts P, Gregor R, *et al.* A study of coronary heart disease trends in Halifax County, *NS Med Bull* 1984;**63:**147-148.
2. Rose G, Blackburn H, Gillum R, Prineas R. London School of Hygiene Cardiovascular Questionnaire. In: *Cardiovascular Survey Methods.* Geneva: World Health Organization, 1982:162-165.
3. Rautaharju P, Warren J, Jain U, Wolf H, Nielsen C. Cardiac Infarction Injury Score: An electrocardiographic coding scheme for ischemic heart disease. *Circulation* 1981;**64**:249-256.
4. Rautaharju P, Neaton J, for the MRFIT Research Group. Electrocardiographic abnormalities and coronary heart disease mortality among hypertensive men in the multiple risk factor intervention trial. *Clin Invest Medicine* 1987;**10**:606-615.
5. U.S. Department of Health and Human Services. Current estimates from the national health interview survey United States 1986. In: *Vital & Health Statistics.* Hyattsville, Md: National Center for Health Statistics, 1987:86-96.
6. Gregor R. Guernsey J, MacKenzie B, Rautaharju P, Wolf H. Betablocker use after acute myocardial infarction. Clin Invest Med 1990;**13:**C66.
7. Yusuf S, Peto R, Lewis J, Collins R, Sleight P. Beta blockade during and after myocardial infarction: an overview of the randomized trials. *Prog Cardiovasc Dis*1985;**27**:335-371.
8. Nidorf S, Parsons R, Thompson P, Jamrozik K, Hobbs M. Reduced risk of death at 28 days in patients taking beta blocker before admission to hosptial with myocardial infarction.*Br Med J* 1990;**300**:71-74.
9. Health and Welfare Canada, Statistics Canada. *The Health of Canadians.* Report of the Canada Health Survey. Ottawa: The Minister of Supply and Services, 1981.
10. Nicholls E, Jung J, Davies J. Cardiovascular disease mortality in Canada. *Can Med Assoc J* 1981;**125**:981-992.

Risk of Hypertension Associated with the Consumption of Sodium in Groundwater in Nova Scotia

A PILOT STUDY

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Sodium in drinking water should be regarded as a contributor to total daily dietary sodium intake. The continuing debate over sodium's role as a factor in the development of hypertension has failed to clarify whether mildly hypertensive patients should be concerned about elevated levels of sodium in their water.[1] Communities, additionally, are waiting for this issue to be resolved. The most recent version of the Canadian Drinking Water Guidelines does not include a drinking water standard for sodium.[2]

This pilot study was initiated in 1988 to address these questions as they apply to rural Nova Scotians. Difficulties with the sampling frame and low participation rates prevented testing of our main hypotheses, however. Marked variability was also observed for water test results collected in 1989 compared with historical data. A proper index of sodium exposure will be required should a full scale study proceed. Physicians should encourage their patients who are concerned about high levels of sodium in well water to sample regularly and closely monitor environmental conditions that might be contributing to these elevated levels.

The pathophysiological role of sodium as a factor in the development of hypertension continues to be a topic for debate amongst scientists.[3] Ever since Dahl originally proposed that hypertension is westernized societies was a disease of excessive salt intake[4], multiple studies have been conducted to test this hypothesis. These studies have generated conflicting results; most recently, the Intersalt Study involving fifty-two worldwide centres,[5] and a large study in Scotland[6] showed a weakly positive relationship, and no association, respectively, after adjusting for age, gender, body mass index, alcohol consumption, and urinary potassium.

Sodium in drinking water may be regarded as a contributing component of total dietary sodium intake. Reports of inverse statistical association between cardiovascular disease mortality and hard water appeared as early as 1957.[7] In Canada, Anderson, *et al* reported areas of Ontario with soft water had higher mortality rates from heart disease than hard water areas.[8] Neri and coworkers studied baseline data on 575 Canadian communities and determined magnesium to be the most important element of fifteen substances evaluated, but the list did not include sodium.[9] As Comstock describes, technical inadequacies plagued the research in this area.[10] Many researchers had performed ecologic studies and had based their findings on correlations only. A number of them failed to make any adjustments for differences in the composition of their study populations. In others, small sample sizes hampered generalization of the data. Needless to say, the research on sodium in water and its role in the development of hypertension has not provided clarification to the dietary sodium question.

This pilot study was initiated in 1988 to address these questions as they apply to Nova Scotians. Nova Scotia continues to have higher cardiovascular disease mortality rates than any other province in Canada.[11] These differences have been attributed to ischemic heart disease.[11] Additionally, both manmade and natural sources of sodium exist commonly in Nova Scotia and include: geological salt deposits, use of road salt during winter months, saltwater intrusions into ground water tables, and ocean spray. Gorham noted that Nova Scotia lakes are proportionately richer in sodium and chloride, much poorer in calcium and bicarbonate and more acidic than world averages.[12] Salt water intrusions, where sea water mixes with groundwater, have been known to generate sodium concentrations as high as 1800 mg/L in Nova Scotia.[13]

Because approximately 80% of Nova Scotia residents living outside metropolitan Halifax obtain their water from groundwater sources, we focused our study on rural Nova Scotia residents. We proposed a historical cohort analysis with the following objectives:

1. To determine whether hypertension occurs more frequently in central Nova Scotia residents who consume elevated concentrations of sodium in ground water, compared to a matched group of central Nova Scotia residents who consume lower concentrations of sodium in groundwater.
2. To compare the prevalence of known risk factors for hypertension (family history of hypertension,

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hypercholesterolemia, smoking, physical inactivity, obesity, alcohol, and oral contraceptive use) between the two cohorts and incorporate these data in the analyses.

METHODS

The Nova Scotia Department of Environmental Groundwater Surveillance Database served as the sampling frame for this study. Our aim was to identify 300 wells with at least one elevated sodium measurement ($\geq$ 50 mg/L) within the past five years in central rural Nova Scotia and match them by place-name to 300 wells with at least one low sodium measurement ($\leq$ 10 mg/L) within the past five years. From each category, 100 residents would be randomly selected for the study after they had met the inclusion criteria. We hoped that this process would generate a study population that was similar with respect to sociodemographic characteristics, and that was free of complicating illness.

INITIAL INCLUSION CRITERIA FOR SODIUM STUDY

Member of High Sodium Cohort = person (aged 30-49) living at central Nova Scotia residence for 5+ years where at least one elevated sodium measurement ($\geq$ 50 mg/L) has been recorded within the past five years and matched by age, sex, smoking status, and place-name and who is free of pre-existing illness.

Member of Low Sodium Cohort = person (aged 30-49) living at central Nova Scotia residence for 5+ years where at least one low sodium measurement ($\leq$ = 10 mg/L) has been recorded within the past five years and matched by age, sex, smoking status, and place-name and who is free of pre-existing illness.

Each subject was initially contacted by a letter, which explained the study, and which requested his or her participation. If an address was not available, the subject was contacted by telephone. The initial letter was followed by a telephone call to schedule an appointment for an interview. The interview was conducted in the subject's home according to the following protocol: first, the study team re-explained the purpose of the study and asked the participant if he or she had any questions. Next, the subject was asked to read and sign the consent form. The consent form also asked for permission to contact the subject's personal physician in order to review the subject's medical records. A fifteen minute standardized questionnaire was then administered by one of the interviewers which asked for sociodemographic information, water and well characteristics, dietary history, smoking habits, and a brief personal and family medical history. A palpatory blood pressure measurement and two standard blood pressure measurements, were taken manually by another interviewer using American Heart Association criteria. One 25 millilitre cold water sample was collected from the kitchen faucet after allowing the water to run for five minutes. A second 25 millilitre water sample was collected every tenth sample to monitor variability in laboratory analytic chemistry procedures. Finally the subject was thanked for his or her involvement. This interview process averaged 30 minutes in total.

The water samples were analyzed at the Dalhousie University Department of Pathology Environmental Chemistry Laboratories. When the results of these analyses became available, a copy was sent to subject's home.

The subject's personal physician was then contacted and asked if a brief medical record review could be performed in order to confirm blood pressure measurements and personal medical history. These data were recorded on a standardized form. The physician was thanked for his/her time. Copies of the final report were subsequently mailed to each physician and study participant.

The standardized questionnaire, water test results and medical record data were coded, then entered into a data base and verified using Paradox 3 (Borland, Int., Scotts Valley, CA, USA). After a series of range checks and frequency analyses to confirm accuracy of data entry, the data were analyzed using SAS (Statistical Analysis System, Cary, NC, USA). The Student's *t* test was used to detect significant differences between means, and the Mantel-Haenszel Chi-Square test was applied to frequencies, where sample sizes were sufficient.

All procedures were approved by the Dalhousie University Faculty of Medicine Ethics Committee on Human Subjects prior to initiation of the study.

RESULTS

The Nova Scotia Department of Environment (NSDOE) Groundwater Surveillance Database yielded 254 wells in central rural Nova Scotia that had a high sodium measurement within the past five years. These wells were successfully matched by placename to 254 wells that had a low sodium measurement within the past five years. Because the purpose of the NSDOE data set is to monitor geographic trends in groundwater quality, the names and addresses of homeowners are not maintained. This information had to be constructed from well logs, telephone listings, communications with local merchants and residents, and with the valued assistance of county officials. This exhaustive search generated a mailing list of only 165 total subjects (32% of the target population) from the 508 wells initially identified. Upon reflection, the Nova Scotia Department of Environment Groundwater Surveillance Database likely generated a study population which may be distorted by high migration rates. This selection bias likely contributed to our inability to locate study subjects.

This frustrating situation was further aggravated by the fact that only 41 individuals of the 165 subjects were willing to participate in the study. Of the 41, 19 were members of the high sodium cohort and 22 were members of the low sodium cohort. Unwilling subjects were queried with respect to the reason for their nonparticipation. The answers generated most often were: 1) lack of interest; or 2) inability to schedule an appointment. Many also failed to meet the inclusion criteria; a number had not lived at their residence for five

years and the water source of some homes had been converted to municipal supplies. Because of the low participation rates we dropped age limits and absence of chronic illness as inclusion criteria and included subjects of any age who had consumed groundwater at their place of residence for at least four years. The extremely low participation rates severely hampered our ability to test our main hypotheses with any degree of confidence. These low rates also limited extrapolation of our findings beyond our study population. The results presented in this document should be interpreted within this context.

We observed that the study population was predominantly caucasian (98%). 84% of the high sodium group and 63% of the low sodium group were female and 32% of the high sodium group and 36% of the low sodium group had completed high school. Table I summarizes mean physical measurements by group and gender. Members of the low sodium group tended to be younger than the high sodium group and this feature was reflected in the lower mean blood pressure measurements. The frequencies of other risk factors for hypertension by cohort were also examined. Though members of the high sodium group were less likely to have ever smoked cigarettes (47% vs 68%), consume alcoholic beverages (74% vs 82%), and more likely to engage in physical activity (89% vs 82%) than members of the low sodium group, the low sodium group had less salt added to food when cooking (36% vs 42%). These differences were not significant, however.

TABLE I

MEAN PHYSICAL MEASUREMENTS BY GROUP AND GENDER — STUDY PARTICIPANTS

	High Sodium[1] Group		Low Sodium[2] Group	
	Male (n=3) $\bar{x}$ (s.d.)	Female (n=16) $\bar{x}$ (s.d.)	Male (n=8) $\bar{x}$ (s.d.)	Female (n=14) $\bar{x}$ (s.d.)
Age	58 (± 5)	51 (± 9)	55 (± 10)	44 (± 12)
Height (inches)	64 (± 1)	64 (± 3)	70 (± 3)	63 (± 3)
Weight (pounds)	162 (± 24)	158 (± 27)	180 (± 32)	157 (± 34)
SBP (mm/Hg)	156 (± 14)	129 (± 15)	152 (± 26)	120 (± 13)
DBP (mm/Hg)	97 (± 13)	79 (± 10)	87 (± 11)	76 (± 8)

1. Unable to test due to small sample sizes
2. No significant differences detected between gender specific subgroups, students t-test $\alpha = .05$

Descriptors of water well characteristics by study group are listed in Table II. The question whether a single historical measurement of sodium concentration provides valid exposure classification scheme is highlighted by the fact that, in the summer of 1989, the mean sodium concentration in the wells of the high sodium group was not significantly different from the mean concentration in the wells of the low sodium group. This variability with environmental conditions was further indicated by study participants' descriptions of changes of water quality during different times of the year (Table III). Laboratory analytic procedures were not

TABLE II

MEAN WATER WELL CHARACTERISTICS BY GROUP[1]

	High Sodium Group (n = 19) $\bar{x}$ (min, max)	Low Sodium Group (n = 22) $\bar{x}$ (min, max)
Sodium conc (mg/L) (Summer, 1989)	69.6 (6.7, 280.0)	41.0 (3.3, 223.0)
Total Ion Conc (meg/L) (Summer, 1989)	3.0 (0.3, 12.2)	1.7 (0.1, 9.7)
Distance of well from nearest salted road (ft)	144.0 (20.0, 1000)	174.0 (15.0, 900.0)
Well depth (ft)	91.7 (12.0, 280.0)	90.6 (6.0, 365.0)

1. no significant differences detected, student t-test, $\infty = .05$

TABLE III

DESCRIPTION OF WATER QUALITY BY STUDY PARTICIPANTS

	High Sodium Group %	(n = 19) (n)	Low Sodium Group %	(n = 22) (n)
Change in water quality after rainfall	32%	(6)	32%	(7)
Change in water quality after heavy use	11%	(2)	9%	(2)
Change in water quality overnight	5%	(1)	0%	(0)
Change in water quality any other time	21%	(4)	27%	(6)
Adequate water supply from well	89%	(17)	82%	(18)
Purchase bottledm water	10%	(2)	5%	(1)

responsible for this variability: no differences in duplicate samples were observed.

History of renal disease (1 high sodium vs 2 low sodium), diabetes (1 high sodium vs 2 low sodium), hepatitis and liver disease (0 high sodium vs 1 low sodium), stroke (0 high sodium vs 0 low sodium), and myocardial infarction (0 high sodium vs 1 low sodium) were confirmed in the medical record reviews. There appeared to be some variability about history of hypertension between the information the subjects recalled and the data obtained from the medical records. Of fifteen subjects claiming not to have a history of high blood pressure (SBP $\geq$ 140 mmHg), the medical records indicated some evidence of hypertension for five individuals (33%). Blood pressure information from the medical records was not available for 12 individuals. Some differences were observed between previous measurements of blood pressure and the results obtained

by our interviewing team. Though individual blood pressures are known to vary over time, this situation is consistent with the literature regarding the difficulties of obtaining reliable blood pressure measurements in individuals. Some of this variability may also be attributed to the therapeutic effect of hypertension medications.

DISCUSSION

Difficulties with the sampling frame and the possibility of a severe selection bias prevented testing of our main study hypotheses. The study did provide an opportunity to examine the reliability of historical measurements of sodium levels in groundwater supplies in Nova Scotia. The two cohorts in this study were selected according to whether a high sodium concentration ($\geq$ 50 mg/L) or a low sodium concentration ($\leq$ 10 mg/L) had been documented for their residence within the past five years. The gap of 40 mg/L sodium was used to compensate for the fluctuations in water quality. Yet the degree of variability that we observed was much greater than we had anticipated. No statistically significant difference was observed between the two groups with respect to sodium concentration; in fact, the range for both groups spanned from less than 10 mg/L to more than 220 mg/L. This observation reinforces the necessity to start with meaningful and carefully collected exposure information when performing environmental epidemiologic assessments. More research should be conducted on the contributing factors which cause these fluctuations in ground water quality. Also of interest is the degree to which the concentrations of other ions present in groundwater vary. An assessment of how our current water well technology might be altered to help improve drinking water quality may also prove beneficial. If a full scale study is to follow from this pilot assessment, a proper index of sodium exposure will need to be developed. Physicians should be aware of fluctuations in groundwater sodium and encourage their patients who are concerned about high levels of sodium in their wells to sample regularly and monitor closely the conditions that might be contributing to this situation.

The significance of the range of 10 mg/L sodium to more than 220 mg/L sodium perhaps should be viewed in the context of the total daily dietary sodium intake. In 1977, National Health and Welfare determined that, in Maritimers as a whole, the average daily adult consumption of tapwater and tapwater-based beverages is 1.43 L.[14] This amount of water would contain 315 mg sodium if the sodium concentration is 220 mg/L, or 10% of the recommended 60 mmol (3500 mg) total daily sodium intake.[15,16] Any reduction of sodium from drinking water sources would be beneficial and may have a significant impact upon hypertension individuals striving to reduce their total dietary salt intake. Consideration of sodium from drinking water sources should, thus, be included as part of any dietary sodium counselling.

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Bibliography

1. Editorial. Salt and blood pressure: the next chapter. *Lancet.* 1989; **i**: 1301-1303.
2. Task Force on Water Quality Guidelines, Environmental Canada. *Canada Water Quality Guidelines* 1987. (Water Quality Objectives Division, Water Quality Branch, Inland Waters Directorate, Environment Canada, Ottawa, Ontario, K1A 0E7).
3. F.C. Luft. Salt and hypertension: recent advances and perspectives. *J Lab Clin Med* 1989; **114**:215-221.
4. L. K. Dahl. Salt and hypertension. *Am J Clin Nutri* 1972; **25**: 231-44.
5. Intersalt Cooperative Research Group. Intersalt: An international study of electrolyte excretion and blood pressure. Results for 24 hour urinary sodium and potassium exertion. *Br Med J* 1988; **297**: 319-328.
6. W.C.S. Smith, I.K. Crombie, R.T. Tavendale, *et al.* Urinary electrolyte excretion, alcohol consumption, and blood pressure in the Scottish Heart Health study. *Br Med J* 1988; **297**: 329-30.
7. J. Kobayashi. On geographic relationship between the chemical nature of river water and death rates from apoplexy. *Ber Ohara Inst Landw Biol* 1957; **11**:12.
8. T.W. Anderson, W.H. LeRiche. Sudden death from ischemic heart disease in Ontario and its correlation with water hardness and other factors. *Can Med Assoc J* 1971; **105**: 155-160.
9. L.C. Neri, J.S. Mandel, P. Hewitt. Relationship between mortality and water hardness in Canada. *Lancet.* 1972; **i**: 931-934.
10. G.W. Comstock. The association of water hardness and cardiovascular diseases: an epidemiological review and critique. *Geochemistry of Water in Relation to Cardiovascular Disease* (National Research Council, National Academy of Sciences, 1979). 48-68.
11. F. White. The Health of Nova Scotians. *NS Med Bull.* 1985; **i**: 65-68.
12. E. Gorham. The chemical composition of lake waters in Halifax County, Nova Scotia. *Limnology and Oceanography* 1957; **2**:12-21.
13. Nova Scotia Department of Environment water well records.
14. V.C. Armstrong, M.G. Holliday, T.F. Schrecker. *Tapwater Consumption in Canada.* (Cat #: H46-2/82-SOE ; ISB 0-662-12489-8), 1981.
15. Food and Nutrition Board, *Recommended Dietary Allowances,* 9th edition, National Academy of Sciences, Washington, D.C. 1980.
16. C. Lentner ed. Nutritional Standards. *Geigy Scientific Tables.* 1981;1:232-266.

The Healthy Communities Project

THE EXPERIENCE OF DARTMOUTH, NOVA SCOTIA

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Doctors may be surprised to realize that the most significant advances in public health have been made by engineers and not by doctors. Dr. Jesse Parfitt of Oxford is fond of repeating this statement and he uses it to emphasize the tremendous advances that were made in public health in the late 1900s to the early part of the 20th century.

The challenges of health care in the 1900s centred around prevention. Diphtheria, polio, typhoid and tuberculosis were familiar infectious diseases and required a containment response. During this period health improved not because medicine improved dramatically but because housing became less crowded, fewer people suffered from food deprivation, the introduction of sewage systems and treatment plants made drinking water safe and because immunization programs were started in schools and communities. The agents for most of these changes were local governments, assisted and prodded by city planners, public health doctors and advocates and frequently citizen action groups.

Today with infectious diseases largely controlled (except for the major hazard in this century — AIDS), we find that our major health problems have their roots in individual life styles and behaviours. We know that smoking, excessive alcohol consumption and high fat diets contribute to lung cancer, heart disease and cirrhosis of the liver. Changes in life style related to smoking and the abuse of alcohol appear to require an individual response. There are other areas of life which impact on our health where individualistic solutions are not as obvious.

In the environment, we are endangered by major threats to our ecosystem, our air, our food, our water and our ozone layer and we need to address these threats soon if we are to survive.

In addition, our population is aging. We know that our seniors population is likely to double in the next fifteen years and we do not have adequate facilities in place to deal and provide them with the quality of life we hope to have at their age.

We also define health now as more than the simple absence of disease. We see it as a state of complete physical, mental, social and emotional well-being. This is why it is important to consider public policy as a major opportunity to improve health, particularly if we view health in this holistic sense.

The Healthy Communities Project is sponsored by three organizations:

1. The Canadian Public Health Association
2. The Canadian Institute of Planners
3. The Federation of Canadian Municipalities

There is a central office in Ottawa funded by Health and Welfare Canada, a National Steering Committee and a National Co-ordinating office established in 1988.

There are many communities across the country that are not intent on becoming healthy communities and that are searching for ways to improve public policy to improve the health of their citizens.

MISSION STATEMENT

THE AIM OF THE HEALTHY COMMUNITIES CONCEPT IS TO ENHANCE THE QUALITY OF LIFE FOR ALL CANADIANS BY INVOLVING MUNICIPALITIES AND THEIR CITIZENS IN ENSURING THAT HEALTH IS A PRIMARY FACTOR IN POLITICAL, SOCIAL, AND ECONOMIC DECISION-MAKING.

It is important that we continue to define health in its holistic sense. This concept of health has virtually nothing in common with the traditional vertical health care system involving doctors, hospitals, nurses, etc. Health is determined by the physical, mental, social, emotional, environmental and spiritual factors that influence a person in his or her community. This is the focus of the healthy communities preventive approach, and the aim is to change public policy.

The City of Dartmouth joined the Healthy Communities Project on September 22, 1987. Apart from the political decision, the City has been fortunate in the direction given by a new administrator, John Burke, who from the beginning understood and supported a Healthy Community Concept and sought to impress this upon all levels and in all the various departments of local government.

The first major policy was carried out on January 1, 1988 when Dartmouth became a non-smoking City. This may not be news now but in January of 1988 the City was the first municipality to declare itself totally non-smoking with no separate areas for smokers or non-smokers. It is also important to mention that this could only have been carried out with the support of the union.

In June of 1988, a new Health and Safety Policy was formally adopted by the City and in the same month a first-ever extensive Employee Assistance Program (EAP) was introduced and is working well.

Through its Parks and Recreation Department, the city continued to encourage physical participation of

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citizens at all levels. Exercise programs like Participaction Days were strongly promoted and it is a remarkable feature of the City to see the number of people out and about in the evenings and during the day obtaining their exercise. Much credit for this must go to the Federal Government program of Participaction allied in the City's own efforts in mildly competitive ways.

Housing is a health issue and public policies were directed at creating better housing for marginalized groups. The City continued to push for affordable housing and, in fact, set up a land banking scheme. It also used, in an innovative way not used in Nova Scotia before, its Board of Health to pursue policies against landlords who were shown to be indifferent in their provision of adequate facilities. Several premises were inspected or condemned. These actions fortunately received considerable media attention which has influenced other potential offenders.

In addition, the City had formed an Affirmative Action-Human Rights Agreement with the Province in 1987. In an effort to encourage Black business people who have not had previous opportunities due to lack of funding, the City began in 1988 a program called "Affirmative Action Pilot". The main benefit to the small contractor is to establish credibility and a track record with lending institutions, thereby allowing small minority contractors the opportunity to secure credit in future endeavours. This year almost $500,000.00 is put aside for minority companies.

In the area of the environment, the City of Dartmouth became the first municipality to examine its purchasing policies looking at those products which might contain chlorofluorocarbons (CFCs). It is not likely that the small amount of CFCs produced by Dartmouth has a major impact on the ozone layer but the concern is symbolic and indicates the role that the City is prepared to take in environmental leadership.

In September 1988, Dartmouth became the first municipality in Nova Scotia to start paper recycling. It is likely now that the Solid Waste Management Advisory Team has reported that recycling will become a major thrust in 1991, in conjunction with the other metropolitan municipalities of Halifax, Halifax County and Bedford. In its effort to produce successful recycling the City produced a mascot called "Michael Recycle". Michael Recycle is a stylized version of a tree. A member of City staff concealed within Michael's trunk went to all the junior high schools and elementary schools in the City to promote the idea of conservation and recycling.

Many other efforts were made in the environmental area. 85% of the paper used by the City is recycled paper. Another initiative is that the spraying of pesticides in residential areas is now strictly controlled.

In April of 1989 the City produced the first AIDS Policy in Atlantic Canada for its employees. In Nova Scotia and mainly in the Halifax-Dartmouth metropolitan area, there have been over forty-five deaths from AIDS since figures were kept. The City's policy is to encourage people to remain at work and to maintain and offered humane and compassionate policies to the sufferers, linked with the realistic concern for their fellow workers.

Continuing the policy regarding health in its holistic sense, the City also set up a Five Star Committee on Accessibility. This is a committee designed to assess and upgrade all facilities and programs within the municipality. The City was delighted to receive a Gold Star Award from the Federation of Canadian Municipalities for its integrated policies and programs in recreation. Dartmouth was the first Atlantic municipality to receive this award.

All these directions were largely due to the efforts on the part of the City, with political decisions taken by Council, and reinforced by a knowledgeable and competent staff. The initiatives of 1988 and 1989 were City-led in an attempt to put our own house in order. The next step was to seek major public input. To this end, it was agreed that the City needed a Healthy Communities Committee and, accordingly, the project was advertised in the local media and applications were requested from citizens who wished to join the committee. Some thirty applications were received and after some initial sorting, fifteen people were selected to form the nucleus of a Healthy Communities Committee. The job of this committee is to find out what the citizens of Dartmouth want and to attempt in a logical and sensible way to provide advisory policies for City Council.

The Healthy Communities Committee has chosen the year 2000 as a target year. This is particularly important for the City of Dartmouth because it is also the 250th anniversary of the founding of our City and makes a splendid milestone. Much thought will be given by this committee while at the same time realizing that municipal finances do not permit an unlimited financial attack on many immediate goals. Prioritization is going to be important and this committee, acting as a sub-committee of the Board of Health, will have a weighty mandate to look at all those parameters that it thinks necessary for a healthy community.

The City's attitude also emphasizes that comparing one community with another is not helpful. The real milestone of success is going to be the improvement over a 5-10 year period of the health of the community and much remains to be done in achieving this.

As we go to press, the Province has now announced that it will fund a health educator to work with this Healthy Communities Committee which will form a model for other communities throughout the Province in years to come. Mrs. Ann Cogdon RN, BSc, Health Ed, started work with the City of Dartmouth, on July 30, 1990. This is an exciting opportunity and we look forward to working with our citizens and the health educator in formulating public policy that will enable us to be healthy in the real sense.

Physicians who are interested in helping their communities to join the "Healthy Communities" initiative are encouraged to contact me. □

The Campaign to Promote Tobacco-Free Pharmacies

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Many pharmacists and other health professionals feel that it is inappropriate for tobacco to be sold in pharmacies. Physicians for a Smoke-Free Canada has undertaken a campaign to promote tobacco-free pharmacies. Ottawa, Hamilton and Halifax-Dartmouth have been surveyed, and have tobacco-free pharmacy rates of 30%, 25.5%, and 7.1% respectively. Physicians are urged to encourage their patients to patronize tobacco-free pharmacies, and to promote legislation to make tobacco-free status a condition of licensure for pharmacies.

Pharmacists rightly see themselves as health care professionals with a legitimate role in the promotion of healthy lifestyles. Many pharmacists recognize that the sale of tobacco products is incompatible with their position in society, and feel that it looks hypocritical for pharmacists to profit from tobacco.[1]

In 1984, the Canadian Pharmaceutical Association (CPhA) and Health and Welfare Canada launched a project called *Stand Up and Be Counted*, which encouraged Canada's 5,500 pharmacies to become tobacco-free. Pharmacists were invited to voluntarily participate at one of three levels, which ranged from completely banning tobacco sales to displaying educational and promotional materials. After two mailings only nine percent of pharmacies were tobacco-free.[2] The CPhA now has a Committee of Pharmacists Against Tobacco Sales (PACT$).

The main problem, of course, is that pharmacies are businesses. Also, pharmacists may not be in a position to make decisions concerning tobacco sales. In 1979, a survey of Canadian pharmacies found one chain that claimed to derive 13% of its annual sales from tobacco.[3] Most pharmacists thought that the major benefit of tobacco was that it drew customers into the store. A 1974 survey found that 22% of all tobacco sales occurred in pharmacies.[3] An article published in the *Canadian Pharmaceutical Association Journal* in 1984 pointed out to pharmacists that it is difficult to promote healthy lifestyles in a store which is actively promoting tobacco.[4]

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METHODS

In early 1989, Physicians for a Smoke-Free Canada undertook a campaign to identify those pharmacies which had eliminated tobacco sales, and to encourage others to do so. Each pharmacy in the Ottawa area was contacted and asked if it sold tobacco products. Those which indicated they did not sell tobacco were contacted a second time by telephone and asked again whether or not they sold tobacco. Direct visits to the pharmacies by one of us (SM) verified their tobacco-free status. These pharmacies were then publicized both in the local media and through widely circulated posters and lists.

In late 1989, we began our campaign in the Halifax-Dartmouth metropolitan area. All pharmacies in the Halifax, Dartmouth, Bedford, and Sackville areas were contacted by telephone. Those that indicated they did not sell tobacco were contacted by telephone a second time and direct visits were made to verify tobacco-free status. Lists of these pharmacies were circulated and published in the local media.

In Hamilton, Ontario a similar compaign to that described in Ottawa and Halifax-Dartmouth has been conducted. Several other centres are targeted and campaigns are just beginning.

RESULTS

In Ottawa, 30 pharmacies were initially identified as tobacco-free. In most cases, they were independent, pharmacist-run businesses. In June 1989, a full page advertisement in all local newspapers listed all of the tobacco-free pharmacies in the city and encouraged patients to take their prescriptions to one of them. Following the newspaper advertisements, a number of pharmacies made the decision to stop tobacco sales, and asked to be included in the list. As of 13 February 1990, 45 out of 130 Ottawa area pharmacies (34.6%) had declared themselves truly tobacco-free, and a further six did not sell tobacco but were located inside stores which did sell tobacco.

The campaign in the Halifax-Dartmouth area revealed that 13 of 85 pharmacies were tobacco-free, although 8 of these were located in stores which did sell tobacco. A list of these pharmacies was sent to every pharmacy in the area, and they were invited to add their names to the list. In January 1990, Physicians for a Smoke-Free Canada and the Nova Scotia Medical Society undertook a joint venture to publish in local newspapers this list of tobacco-free pharmacies, together with a message urging patients to take their prescriptions to one of these pharmacies. Subsequent to the

NOTICE Re: BY-LAW AMENDMENTS

The Medical Society of Nova Scotia

The By-Laws of The Medical Society stipulate that amendments to them may be proposed at an Annual Meeting of The Society provided they are published in the Journal at least one month prior to the Annual Meeting.

The following amendments will be presented and recommended by the Executive Committee at the 1990 Annual Meeting of The Society.

EXISTING	PROPOSED
Section 1.3, which was a proposed addition to the By-Laws in 1988, was omitted in error, and is presented here for approval:	
1.3 Does Not Exist	**1.3** The Seal of The Medical Society of Nova Scotia designed and approved in 1961 shall be the Seal of the Society, shall be in the custody of the Executive Director and shall be affixed by him to all documents that require to be sealed.
2 OBJECTS	**2 OBJECTS** ADD: The objects of the Society are:[for clarity]
2.1g. That no Physician be denied membership in the Society on the basis or race, religion or place of origin.	**2.1g.** Delete [unneccesary, and in any event not an object]
4 BRANCH SOCIETIES	
4.1.3 Each Branch shall be entitled to nominate for the Executive Committee of the Society the number of members to which it may be entitled under Chapter 12 of these By-Laws.	**4.1.3** Delete "Chapter" Substitute "Section" [a more appropriate word]

EXISTING	PROPOSED
4.2 DUTIES AND RESPONSIBILITIES	**4.2.2** Insert "each Branch" following "as soon as possible thereafter ----" [clarity]
4.2.2 Each Branch shall, on request, submit to the Executive Director of the Society six weeks prior to the Annual Meeting the names of its nominess or appointees (as applicable) to the Executive Committee, the Nominating Committee and to Council together with the names of alternate or alternates as may be required for the following year. As soon as possible thereafter, shall forward any changes or corrections which may have become necessary by change of circumstances.	
4.4 EXISTING BRANCHES	
4.4.3 A Branch Society shall agree to amend, where necessary, its Constitution and By-Laws and Rules and Regulations to place them in harmony with the Constitution, By-Laws , Rules and Regulations and Appendices of this Society.	**4.4.3** Delete "agree to" [for precision]

Section 6.1 of the By-Laws should be amended to reflect changes in the categories of membership recognized by the Society. There was no requirement for a Special Members category (the Honorary Members category fills this need) but that there is a need to have a temporary membership category. The Section should be amended to read:

6 MEMBERSHIP AND DISCIPLINE	**6 MEMBERSHIP AND DISCIPLINE**
6.1 The Society shall be composed of regularly qualified physicians, internes and residents, and medical students. The Medical Act requires that every duly qualified medical practitioner shall pay the annual membership dues on or before October 1 each year. Every duly qualified medical practitioner who fails to pay annual membership dues ceases to be in good standing and thereupon becomes suspended as a qualified medical practitioner. Any physician not wishing to be a Society member should communicate that wish to the Society in writing. Categories of membership are: 1st Year of Actual Practice, Ordinary, Post Graduate, Internes/Residents, Non Resident (Nova Scotia *only*), Non Resident (*Conjoint*), Retired, Senior, Honorary, Student, Non-Practising Scientist, Courtesy, and Over Sixty-Five.	**6.1** The Society shall be composed of regularly qualified physicians, internes and residents, and medical students. The Medical Act requires that every duly qualified medical practitioner shall pay the annual membership dues on or before October 1 each year. Every duly qualified medical practitioner who fails to pay annual membership dues ceases to be in good standing and thereupon becomes suspended as a qualified medical practitioner. Any physician not wishing to be a Society member should communicate that wish to the Society in writing. Categories of membership are: 1st Year of Actual Practice, Ordinary, Post Graduate, Internes/Residents, Non Resident (Nova Scotia *only*), Non Resident (*Conjoint*), Retired, Senior, Honorary, Student, Non-Practising Scientist, Courtesy, Over Sixty-Five and Temporary.

EXISTING	PROPOSED

Sections 6.2.2 and 6.2.3 of the By-Laws relate to all Categories of Membership and should therefore be renumbered 6.1.1 and 6.1.2

6.2.2 Medical Society members in good standing may become members of a Branch Society upon application to the Branch Society.	**Renumber 6.1.1**
6.2.3 Eligibility for election to office in the Society shall include membership in a Branch and The Canadian Medical Association.	**Renumber 6.1.2**

While it may be appropriate for members of the Society to be members of more than one Branch Society, representation of Branch Societies on the Executive Committee and at Council depends on the number of members in that Branch Society. In order to prevent a member or members from being counted more than once, the following addition is proposed:

6.1.3 Does Not Exist	**6.1.3** In order to determine representation of Branch Societies to the Executive Committee and Council, each member will indicate with which Branch Society he should be counted.

The dues for Ordinary Membership in the Society are regularly altered at the Annual Meeting, however the dues for other categories are set by an unwritten tradition. I should like to recommend that the procedure be formalized.

6.1.4 Does Not Exist	**6.1.4** All membership dues shall be set at the Annual Meeting.

Section 6.2.1 of the By-Laws relating to Ordinary Members does not reflect current practice and the following amendment is suggested:

6.2 Ordinary Members	**6.2 Ordinary Members**
6.2.1 A member in good standing in a Branch may, upon application to the Society, become an Ordinary Member of the Society. The application shall include endorsement from two members of the Society and payment of the appropriate dues is to accompany the application. In the event of rejection of the application by the Executive Committee the dues payment shall be returned to the applicant.	**6.2.1** A member in good standing who is licensed to practice medicine in Nova Scotia and who is resident in the province at the time of application.

EXISTING	PROPOSED

At the 8th (1986) Officers' Meeting a policy decision was made and subsequently ratified by the Executive Committee that:

> "It be approved to utilize the membership category of Courtesy for the purpose of maintaining Society membership for doctors who may have their license temporarily suspended or revoked while undergoing rehabilitation."

It is recommended therefore that Section 6.5 of the By-Laws be re-written:

6.5 Special Members and Courtesy Members:	**6.5 Courtesy Members:**
6.5.1 It shall be the prerogative and the privilege of the Executive Committee or its Chairman, or of the President of the Society acting on its behalf, to receive on invitation as Special Members, medical doctors or distinguished scientists non-resident in Nova Scotia and non-medical teachers of ancilliary sciences in our medical schools who may or may not be residents of Nova Scotia and to accord to them full privileges of membership in the Society. They shall hold their connection until the close of the meeting at which they are introduced and may participate in all the affairs of the meeting except voting and payment of fees.	**6.5.1** A member in good standing in the Society whose license has been temporarily revoked by the Provincial Medical Board pending rehabilitation may retain membership in the Society as a Courtesy Member. Courtesy members may attend meetings but may not vote.
6.5.2 Courtesy Members of the Society shall be members of the profession who have practised in Nova Scotia, who are no longer licensed to practice in Nova Scotia for reasons other than set out in Article 6.7.3., and who have been members in good standing of The Medical Society of Nova Scotia immediately prior to relinquishing their license.	**6.5.2** Delete

In line with proposed 6.1.2, Section 6.6.1 should now read:

6.6 Medical Student Members:	**6.6 Medical Student Members:**
6.6.1 All medical students enrolled in the Faculty of Medicine, Dalhousie University are recognized as Medical Student Members of the Medical Society. Medical students may enjoy the rights and privileges of the Medical Society but may not hold office or vote except as set out in Chapters 9 and 12. They shall pay such annual dues as are levied by the Executive Committee. They may become members of The Canadian Medical Association.	**6.6.1** All medical students enrolled in the Faculty of Medicine of Dalhousie Univeristy are recognized as Medical Student Members of the Medical Society. They may enjoy rights and privileges of the Medical Society but may not hold office or vote except as set out in Sections 9 and 12 of the By-Laws.

EXISTING	PROPOSED
6.7 FIRST YEAR PRACTICE MEMBERS	**6.7** Insert: The following defintions apply: [for clarity]
	I.R.A.N.S. has been re-named, Section 6.8.1 should be changed:
6.8 Post Graduate Members:	**6.8 Post Graduate Members:**
6.8.1 An Ordinary Member undertaking post-graduate training (e.g - a Fellowship) of not less than one year, in a program other than Dalhousie's Program, plus Dalhousie Residents not in IRANS - e.g. Armed Forces or externally funded.	**6.8.1** An Ordinary Member undertaking post-graduate training program of not less than one year, either through the Dalhousie Program but externally funded or through another program.
	Again in line with proposed 6.1.2, Section 6.13.1 should be amended:
6.13 Non-Practising Scientist Members:	**6.13** Non-Practising Scientist Members:
6.13.1 An Ordinary Member employed as a basic scientist in Dalhousie University and not practising medicine except on an emergency basis *only*. The dues for this category are 50 percent of the dues for an ordinary member *plus* $15.00 for the C.M.E. Levy, *plus* C.M.A. dues at 50 percent.	**6.13.1** An Ordinary Member employed as a basic scientist in Dalhousie University and not practising medicine except on an emergency basis.
For some time now the Society has recognized a locum category of practitioner and it is necessary to amend the By-Laws. In order to add this some renumbering is required:	
6.15 Suspension of Membership	**6.15 Temporary Members**
	6.15.1 Temporary membership in the Society may be granted to physicians temporarily licensed to practise in Nova Scotia for a pre-defined purpose. Such members may attend meetings of the Society but may not vote.

EXISTING	PROPOSED
6.17 Does Not Exist	**6.17 Suspension of Membership**
6.17.1 Does Not Exist	**6.17.1** Any member whose license to practice medicine is revoked by the Provincial Medical Board of Nova Scotia under provisions of the Medical Act loses ipso facto his right to membership in the Society and thereby forfeits all his rights and privileges appertaining to membership in the Society.
6.17.2 Does Not Exist	**6.17.2** Any member whose license is temporarily suspended by the Provincial Medical Board of Nova Scotia for reasons of abuse of alcohol, drugs or other substances may retain membership in the Society as a Courtesy Member in accordance with section 6.5 of these By-Laws.
6.17.3 Does Not Exist	**6.17.3** Any member losing his membership in the Society pursuant to section 6.17 shall, subject to conditions imposed by the Executive Committee and provided that he has regained his license to practice medicine, be restored to membership upon resolution of the Executive Committee.
8 MEETINGS	
8.1 RULES OF ORDER	
8.1.1 Bourinot's Rules of Order. Third Revised Edition, shall be the guide for conducting all meetings of the Society, of Council and of the Executive Committee.	**8.1.1** Delete: "Third Revised Edition" Substitute: "In its most current edition." [for flexibility]

EXISTING	PROPOSED

Section 9.2.1 of the By-Laws requires some attention, in part because of changes to the structure of Maritime Medical Care and the dissolution of the Provincial Health Council. The Medical Society representatives to the Health Services Insurances Commission should be included as members of Council. Some editorial changes have been made for the sake of clarity, and I suggest that the term "ordinary member" be changed to "voting member" to avoid confusion.

The amended section would read:

9.2.1 Council shall be restricted to members in good standing of the Society and if eligible by such membership they shall be:

a. The members of the Executive Committee;

b. The Chairman of all Standing and Special Committees;

c. All living Past Presidents preceding the immediate Past President;

d. All living Past Presidents of The Canadian Medical Association when they are Members of The Medical Society of Nova Scotia;

e. The Chairman of each Section;

f. The representative of the Society to any paramedical or voluntary association;

g. The members of the Nominating Committee;

h. The representative and his designated alternate to the Executive Committee of The Canadian Medical Association;

i. The representatives of the Society to the General Council of The Canadian Medical Association;

j. The Deputy Minister of Public Health of Nova Scotia;

k. The President of Maritime Medical Care;

l. The President and Secretary of each Branch Society;

m. The President and the Registrar of The Provincial Medical Board;

n. To increase general practitioner representation on Council representatives as follows:

From each Branch having fifty members or less in good standing in the Society, one member; and for each fifty over the first or fraction thereof shall have the right to nominate more than three general practitioner representatives.

9.2.1 Voting members of Council shall be restricted to voting members of the Society. The following are members of Council who may appoint alternates:

1. The members of the Executive Committee.
2. The Chairmen of all Standing and Special Committees.
3. The members of the Nominating Committee.
4. The Chairman of each Section.
5. The Chairman of the Board of Maritime Medical Care.
6. The President and Secretary of each Branch Society.
7. Branch Societies may appoint one general practitioner, however if Branch membership is one hundred or more members, then a second general practitioner may be appointed.
8. The Dean of Medicine of Dalhousie University.
9. One student member from each of the four medical student classes of Dalhousie University who is not a member of Council for any other reason. Medical students so appointed become voting members of the Society from the opening of the first session of Council to the close of the Annual Meeting.
10. The Medical Director of Maritime Medical Care.

The following may be appointed to Council, but they shall not be allowed alternates:

1. Any Past President preceding the immediate Past President.
2. Any Past President of the Canadian Medical Association.

EXISTING	PROPOSED
o. The immediate past Chairman of the Executive Committee;	3. The representative of the Society to any paramedical or voluntary association.
p. The Dean of Medicine, Dalhousie University;	4. The representative and his designated alternate to the Executive Committee of the Canadian Medical Association.
q. The Nova Scotia Division Representative to each of the five C.M.A. Councils;	5. The representatives of the Society to the General Council of the Canadian Medical Association.
r. One student member from each of the four medical student classes who is not a member of Council for any other reason;	6. The Deputy Minister of Health and Fitness of Nova Scotia.
s. The Chairman of any C.M.A. Council when he is an Ordinary Member of The Medical Society of Nova Scotia;	7. The President and Registrar of the Provincial Medical Board of Nova Scotia.
t. The Chairman of the Provincial Health Council if an Ordinary Member of The Medical Society of Nova Scotia;	8. The immediate past chairman of the Executive Committee.
u. The Dalhousie University Vice-President for Health Sciences if an Ordinary Member of The Medical Society of Nova Scotia;	9. The Nova Scotia Division representative to each of the five Canadian Medical Association Councils.
v. The Medical Director of Maritime Medical Care Inc.	10. The Chairman of any Canadian Medical Association Council.
	11. The Dalhousie University Vice-President for Health Sciences.
	12. The representatives of the Society to the Health Services and Insurance Commission.
9.3 MEETINGS OF COUNCIL	
9.3.4 Presiding Officer. The Chairman of all meetings of Council shall be the Chairman of the Executive Committee. In his absence the Vice-Chairman shall preside.	**9.3.4** Delete: Presiding Officer [unncessary]

EXISTING	PROPOSED

It has been apparent for some time that although the Officers have a crucial role in the Society, they have no terms of reference within the By-Laws. I should like to propose therefore the following Terms of Reference for a new Statutory Committee.

10.2 Does Not Exist	**10.2 The Officers' Committee**
10.2.1 Does Not Exist	**10.2.1** The Officers' Committee shall consist of the Officers of the Society, and, quorum shall be four of the elected Officers. The President shall be the chairman.
10.3 Does Not Exist	**10.3 Duties of the Officers' Committee**
10.3.1 Does Not Exist	**10.3.1** The Officers' Committee is charged with conducting the affairs of the Society in between meetings of the Executive Committee. It shall have all the rights and powers of the Society except those specifically or generally reserved. It shall meet as often as it is necessary at the call of the Chairman or of any four of its members and shall give an account of its actions to the Executive Committee.

EXISTING	PROPOSED
Section 11.6.2 of the By-Laws contains an error as presented to the Annual Meeting of 1988 and requires amendment:	
11.6.2 He shall, with approval of the Executive Committee, appoint three advisors to form a Finance Committee, which Committee shall also act as a Budget Committee. He shall, at every Annual Meeting, or more often if required by the President, present his accounts with the vouchers duly audited and signed by the auditors. At the end of his term of office he shall hand his accounts to his successor or the President of the Society together with the money, books and other property belonging to the Society.	**11.6.2** He shall, with approval of the Executive Committee, appoint four voting members to form a Finance Committee, which Committee shall also act as a Budget Committee. He shall, at every Annual Meeting, or more often if required by the President, present his accounts with the vouchers duly audited and signed by the auditors. At the end of his term of office he shall hand his accounts to his successor and the President of the Society together with the money, books and other property belonging to the Society.
Section 12.2 of the By-Laws need to be amended to read:	
12.2 Appointment of Statutory Committees: Statutory Committees shall be: The Nominating Committee The Executive Committee The Finance Committee	**12.2 Statutory Committees shall be:** The Nominating Committee The Executive Committee The Finance Committee The Officers' Committee
Section 12.3.2.2 of the By-Laws should be re-worded for consistency and clarification:	
12.3 The Nominating Committee	
12.3.2.2 The Nominating Committee shall make known the names of the proposed Officers of The Medical Society of Nova Scotia to the Medical Society at least four weeks prior to their official presentation at the Annual Meeting.	**12.3.2.2** The report of the Nominating Committee shall be published in "The Journal" not less than four weeks prior to the Annual Meeting.

EXISTING	PROPOSED

Section 12.3.3.2 of the By-Laws should be rewritten and relocated, the following amendment is proposed:

12.3.3.2 The Nominating Committee and Branch Societies shall adopt the principle that members of the Executive Committee shall be elected annually, but shall not hold office for more than three consecutive years. Following a three-year consecutive term no member shall be eligible for nomination until at least one year has elapsed.	**12.3.3.2** Branch Representatives to the Executive Committee, and their alternates, shall be nominated annually. No member shall be nominated to the Executive Committee in either capacity for more than three years consecutively. After an absence of one year such a member will again be eligible for nomination.
	12.4.9 The Executive Committee shall include in the agenda of its next scheduled meeting, any matter brought before it by the chairman of any section of the Society, or his appointed delegate, provided that a written request to do so be presented to the Executive Director no less than five days prior to the meeting. The request shall include the nature of the subject for discussion. A Section may similarly be represented at any special meeting of the Executive Committee provided that the subject matter is consistent with the agenda for the special meeting.
12.4.9 The Executive Committee shall be responsible for the appointment of the appointed officials, shall designate their responsibilities and fix their salaries.	**Renumber 12.4.10**
12.4.10 Members of the Executive Committee shall be reimbursed on a basis to be determined by the Committee for their legitimate travelling expenses incurred in attending meetings of the Executive Committee other than those held in conjunction with the Annual Meeting of the Society.	**Renumber 12.4.11**

RECOMMENDATIONS:

1. **THAT the proposed amendments be adopted."**

2. **THAT all existing By-Laws be repealed, and a new set of By-Laws be adopted, incorporating these changes."**

THE MEDICAL SOCIETY OF NOVA SCOTIA

NOVA SCOTIA DIVISION OF THE CANADIAN MEDICAL ASSOCIATION

MEMBERS OF EXECUTIVE COMMITTEE

OFFICERS

President ..... P.D. Jackson
President-Elect ..... W.D. Canham
Past President (Immediate) ..... V.P. Audain
Chairman of the Executive Committee ..... G.A. Ferrier
Vice-Chairman ..... D. Ryan-Sheridan
Treasurer ..... R. Brewer Auld
Honorary Secretary ..... S.M.T. Leahey
Executive Director ..... H.M. Epstein

OBSERVERS AND STAFF

Economics Committee Chairman ..... R.J. Gibson
Director, Economics Department ..... R.J. Dyke
Director of Communications ..... D. Grant

BRANCH SOCIETY REPRESENTATIVES

Antigonish-Guysborough ..... M.A. MacKenzie
Bedford-Sackville ..... B.M. O'Hearn
Cape Breton ..... P.W. Littlejohn
Colchester-East Hants ..... G.A. Corbett
Cumberland ..... J.P. Donachie
Dartmouth ..... C. Gallant & M.F. Moriarity
Eastern Shore ..... D.R. Barnard
Halifax ..... R.D. Gregor & D.C.S. Brown
Inverness-Victoria ..... C.W. Chow
Lunenburg-Queens ..... B.N. Chutskoff
Pictou ..... H.P. MacDonald
Shelburne ..... Gordon Hollway
Sydney ..... J.R. LeMoine
Valley ..... C.L. Smith & P.D. MacLean
Western ..... M.A.C. Duggan
Student Members .... Diane McLennaghan, Sarah Kerr & Alexandros Alexiadis
I.R.A. Representatives ..... Andrew Orr, Daniel Vaughan

OBSERVERS

Editor-in-Chief — The Nova Scotia Medical Journal ..... J.F. O'Connor
Medical Director M.M.C. Inc. ..... A.C. Watson
President & C.E.O. M.M.C. Inc. ..... D.L. McAvoy
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STANDING COMMITTEES

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Archives	
Building	J.F. Hamm
By-Laws	P.W. Littlejohn
Child Health	N.P. Kenny
Community Health	D.B. Langille
Environment	G.H. Bethune
Ethics	D.F. Fay
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Home Care	D.P. Cudmore
Hospital & Emergency Services	D.M. Maxwell
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(i) Minister of Health	
(ii) Workers' Compensation Board	
(iii) Registered Nurses' Association	
(iv) Faculty of Medicine	
Maternal & Perinatal Health	A.C. Allen
Mediation	President
Medical Education	A.H. Murray
Membership Services	G.L. Myatt
Mortality Review (Appointed by and Reports Through Section of Anaesthesia)	K.W. Fairhurst
Occupational Health	R.E. Marchant
Pharmacy	S.G Carruthers
Professionals' Support Program	W.G. Gill
Risk Management	J.P. Anderson
Senior Advisory Committee	J.D.A. Henshaw

New Address: Oct. 22/90
5 Spectacle Lake Drive
City of Lakes Business Park
Dartmouth, N.S. B3B 1X7
(902) 468-1866

BRANCH SOCIETIES

	President	Secretary
Antigonish-Guysborough	J. Hamilton	S. Rappard
Bedford-Sackville	C.A. Forbes	J. Fraser
Cape Breton	D.P. Hickey	P.W. Littlejohn
Colchester-East Hants	G.A. Corbett	D.B. Langille
Cumberland	A. DeCroos	W. Smolonski
Dartmouth	G.G.R. Stewart	M.W. Ellis
Eastern Shore	D.P. Sinha	R.J. Fraser
Halifax	D.C.S. Brown	D.A. Stinson
Inverness Victoria	K.R. Murray	R.J. Genge
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Shelburne	I.C. Cree	Mark Riley
Sydney	F. Buhariwalla	M.A. Campbell
Valley	R.G. Bustin	R.C. Jung
Western	W.M. Gorman	A.M. Cottreau

SECTIONS

Anaesthesia	A.J.M. Clark	A. Finlayson
Emergency Medicine	D.E. Sinclair	L.M. Costello
General Practice	J.K. Hayes	S.A. Canham
Internal Medicine	J.L. Sapp	N.L. MacDonald
Internes & Residents	P.C. Champion	C. Zip
Obstetrics and Gynaecology	R.H. Lea	
Ophthalmology	D.M. Keating	F.J. Carpenter
Orthopaedic Surgery	J.L. Leahey	E. Howatt
Otolaryngology	C.C. Cron	G.F. Martin
Paediatrics	A.F. Pysemany	A.E. Hawkins
Laboratory Medicine	A.I. Bernardo	D.F. Glasgow
Psychiatry	J.V. O'Brien	P.A. Moss
Radiology	G.J. Butler	C. Lo
Surgery	A.J. Bodurtha	P.D. Roy
Urology	S.G. Lannon	R.W. Norman
Vascular Surgery	J.A.P. Sullivan	R.S. Dunn

publishing of the list, one further pharmacy has identified itself as tobacco-free. The current figure is 6 of 85 or 7.1% truly tobacco-free pharmacies.

The situation in Hamilton is similar to that in Ottawa. Of 90 pharmacies, 23 do not sell tobacco, and eight do not but are inside stores which do. Of the remaining 59 pharmacies, 11 have plans to stop the sale of tobacco products. Truly tobacco-free pharmacies make up 25.5% of the total in Hamilton.

DISCUSSION

Of the three cities which have been well studied, the Halifax-Dartmouth area has by far the poorest record with regard to tobacco sales in pharmacies. Ottawa and Hamilton have a three to four times higher rate of tobacco-free pharmacies. The pharmaceutical profession of Nova Scotia should be taken to task for failure to actively work toward ending tobacco sales in pharmacies, a goal which claims to support (Personal Communication: Gerald B. Locke, Registrar-Inspector, Nova Scotia Pharmaceutical Association, 18 January 1990).

All pharmacists do not agree with the elimination of tobacco sales. A letter in the January 1990 issue of *CPJ* claimed that a small pharmacy made a net profit of $10,000 from tobacco sales, making it the third most profitable product sold. The author stated, however, that he often counsels his customers about the evils of smoking.[6] The major drugstore chain in Canada is Shoppers Drug Mart. Imasco Corporation owns both Shoppers Drug Mart and Imperial Tobacco. Pharmacists working for Imasco may not be in a position to influence policies on tobacco sales.

The Canadian Pharmaceutical Association claims to support the idea of pharmacies dropping tobacco sales.[7] The professional bodies of pharmacists across the country seem to be in considerable disagreement about the stand they should take. In Nova Scotia, the Pharmaceutical Society feels that each person has the right to freedom of choice.[6] However, in Alberta, the Pharmaceutical Association questions whether. "As professionals whose main job description is to assist, aid and promote well-being, good health and public education with regard to the optimal use of drugs, can we continue to sell tobacco products?" They go so far as to suggest that pharmacists may be breaking their own code of ethics, which states that, "A pharmacist shall not lend his support or his name to the promotion or exploitation of objectionable or unworthy products".[8] These authors estimate that 20% of Alberta pharmacies are already tobacco-free.

The Alberta Pharmaceutical Association has indicated that they may support the adoption of provincial legislation to eliminate the sale of tobacco in pharmacies (Personal Communication: O. Kochan, Deputy Registrar, The Alberta Pharmaceutical Association, 18 January 1990). It is the view of Physicians for a Smoke-Free Canada that legislation is necessary to achieve the goal of tobacco-free pharmacies. Since many individual pharmacists favor the elimination of tobacco sales, they should pressure their regulatory bodies to propose such a change in licensing requirements. This could be done either through legislation or by regulation, depending on the provincial situation. Many years of proposing that pharmacies voluntarily give up selling a very lucrative product have led to very little progress. Imasco is unlikely to permit Shoppers Drug Mart, the industry leader, to voluntarily give up the sale of its products.

The sale of tobacco in pharmacies gives these products false legitimacy by associating them with prescription drugs. Physicians should direct their patients to pharmacies which do not sell tobacco, and should inform pharmacies which continue to sell tobacco what they are doing and why. If there are no tobacco-free pharmacies in a town, the pharmacists should be approached and advised that the ones which go tobacco-free will be recommended by local physicians. Prescription pads are available from the Medical Society of Nova Scotia which include a message advising patients to patronize tobacco-free pharmacies. □

References

1. Pellow DE. Applying Your Principles. *Can Pharmaceut J* 1989;**21**:515.
2. Fevang L. Collishaw N, Tripp G. *Stand Up and Be Counted: Promoting a Smoke-Free Generation in Canadian Pharmacies.* Unpublished. Ottawa, June 1985.
3. Thomas EM. How do Pharmacists Feel About Smoking? The Preliminary Results of a 1979 Survey. *Can Pharmaceut J* 1989;**12**:402-404.
4. Collishaw N, Rogers B. Tobacco in Canada. *Can Pharmaceut J* 1984;**16**:147-150.
5. McCarthy RJ. Tobacco Rebuttal. *Can Pharmaceut J* 1990;**22**:5.
6. Gibbs D. Keeping Track. *Can Pharmaceut J* 1990;**22**:133.
7. Raisbeck J. West Tackles Tobacco Question. *Can Pharmaceut J* **22**:170-171.

137th Annual Meeting

The Medical Society of Nova Scotia

This year's Annual Meeting will be launched at the official opening of the Society's New Headquarters, 5 Spectacle Lake Drive, City of Lakes Business Park in Dartmouth, on Thursday evening November 15th.

The Annual Meeting and Council Meetings as well as the Banquet and Ball will take place at the Nova Scotian Hilton Hotel International in Halifax.

REMEMBER THE DATES

NOVEMBER 15-17, 1990

Hospitalization of Mental Disorders in Nova Scotia

TRENDS AND COMPARISONS

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The advances of psychiatry over the past decades has reduced institutionalization. Psychiatric care is more often delivered in regional hospitals and in community settings. This paper examines the extent to which these changes have affected Nova Scotia. Using data from the Nova Scotia Department of Health and Fitness and Statistics Canada, mental disorder admission rates and bed utilization for Nova Scotia are compared for the years 1971 and 1986 and against Canada as a whole. While Nova Scotia used less mental hospital beds in 1986 compared to the earlier period, the province persists in emphasizing the mental hospital alternative compared to the rest of Canada.

Psychiatry has changed markedly in recent years. Treatment is more effective, hospital conditions have improved and lengths of stay have shortened. The emphasis has shifted from isolated mental hospitals to services in the local community. In all parts of the world, treatment is moving to regional general hospitals, community clinics and private pratice. The purpose of this study is to examine the extent to which these changes have affected Nova Scotia.

METHOD

This paper considers changes in hospital care in Nova Scotia between 1971 and 1986, and compares the 1986 Nova Scotia data with national data (8 provinces). The data come from the Nova Scotia Department of Health and Fitness and from Statistics Canada. Hospital data include mental hospitals and general hospitals (both psychiatric units and non-specialized or scatter-beds). Mental disorders are those covered by Chapter V of the International Classification of Diseases. Chapter V includes functional psychoses (mainly schizophrenia and affective psychoses), alcohol and drug disorders, mental retardation, organic psychoses and non-psychotic disorders (mainly neuroses and personality disorders).

Mental hospital services range from short-term intensive treatment to long term care, shelter and asylum. Canadian Provinces differ in the extent to which they care for the long-term mentally disabled in mental hospitals, homes for special care or regional community support settings. This paper focuses on short and medium-stay mental hospital patients with lengths of stay under one year. The rates are based on the Census populations for 1971 and 1986.

RESULTS

Table I presents hospitalization rates for mental disorders for Nova Scotia for 1971 and 1985 and then compares the ratio of rates for 1986 versus 1971. This information is then compared with Canadian mental disorder hospitalization rates in 1986 and against the ratio of Nova Scotia to Canadian rates for that year.

TABLE I

HOSPITALIZATION OF MENTAL DISORDERS NOVA SCOTIA 1971, 1986; CANADA 1986 ADMISSION RATES, BED USE RATES

	— Nova Scotia —			— 1986 —	
	1971	1986	1986/ 1971 (%)	Can.	NS/ Canada (%)
Admission rate per 100,000:					
All hospitals	893	892	100%	735	121%
Mental hospitals	437	305	70	132	231
General hospitals	455	586	129	602	97
Functional psychoses	237	272	115	263	103
Non-psychotic	423	372	88	281	133
Mental hospitals					
Functional psychoses	130	109	84	64	171
Non-psychotic	126	103	81	37	276
Bed use per 100,000: (under one year stay)					
All hospitals	74	55	75	47	116
Mental hospitals	58	30	52	17	181
General hospitals	16	25	158	31	80
Functional psychoses	30	26	86	24	105
Non-psychotic	24	19	78	14	133
Mental hospitals					
Functional psychoses	25	14	58	10	147
Non-psychotic	15	10	63	4	250

Note: Canada excludes Manitoba and New Brunswick

Nova Scotia trends — 1986 vs 1971

For all diagnoses, mental hospital admission rates decreased and general hospital rates increased but the overall admission rate remained the same. The admission rate for non-psychotic disorders decreased 12% and the admission rate for functional psychoses increased 15%.

Total bed use (under one year) decreased by 25%. Mental hospital bed use decreased by one half while general hospital bed use increased over one half. This is well illustrated by Figure 1.

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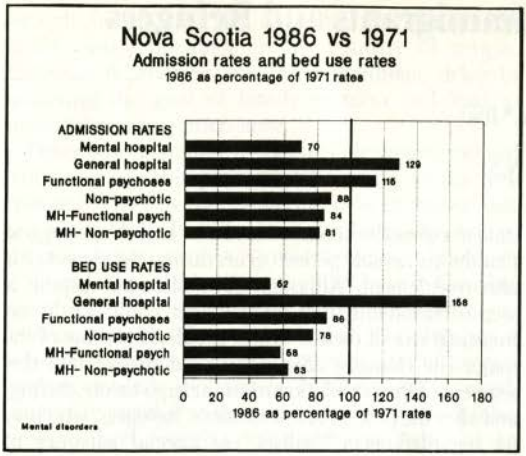
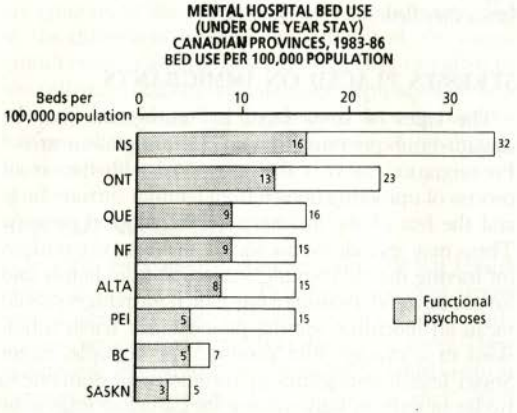


Figure 1



Note: 1983/86 data not available for Manitoba, New Brunswick.

Figure 2

Comparison of Nova Scotia with Canada

Despite the major shifts in hospital use between 1971 and 1986, Nova Scotia maintains its emphasis on mental hospitals. For the three year period 1983-86, Nova Scotia had the highest use of mental hospitals (under one year stay) in Canada (Fig. 2). Nova Scotia has the highest Canadian mental hospital bed use rate for children, a rate of 10.5 beds per 100,000 population, ten times higher than the Canadian average.

During 1986 mental hospital admission rates in Nova Scotia were 231% of the national average (Fig. 3). Mental hospital admission rates for non-psychotic disorders were even higher, 276% of the national average. Nova Scotia bed use shows the same emphasis on mental hospitals, 81% above the national average. General hospital bed use was 20% below the national average.

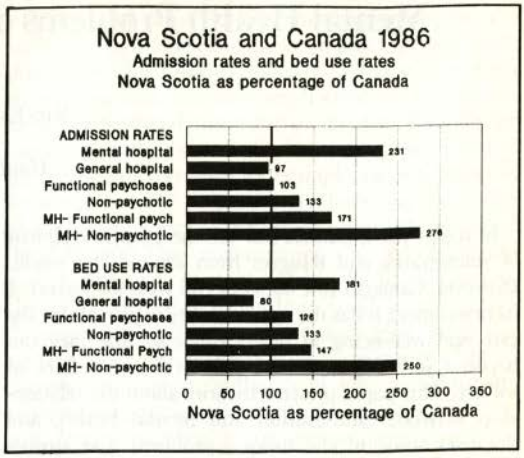


Figure 3

DISCUSSION

Over a 15 year period Nova Scotia shows less use of mental hospitals and a greater use of general hospitals, yet Nova Scotia still has the highest rates for mental hospital use in Canada. These mental hospital rates are high not just for major mental disorders (the functional psychoses) but for non-psychotic disorders and for children.

These comparisons show that Nova Scotia persists in emphasizing mental hospitals. In 1986 Nova Scotia had 113 mental hospital beds more than the Canadian average (13/100,000 × 873,180). Without using any new money, reallocation of the personnel resources attached to these 113 mental hospital beds would regionalize services throughout the province, expand general hospital psychiatry and extend community support programs for the mentally disabled. With this reallocation Nova Scotia would then be following the general Canadian trends for reducing the emphasis on mental hospitals. □

References

Richman A., and Riley R. Are mental hospital admission rates going up or down? Presented at the American Psychiatric Association Annual Meeting, New York, May 1990.

Riley R., and Richman A. The treatment of mental disorder in hospitals. In press *Health Reports* 2(1): 1990.

On March 30, 1787, Wolfgang Amadeus Mozart (1756-1791) wrote (in English) in a Brother Freemason's book:

"Patience and tranquility of mind contribute more to cure our distempers than the whole of medicine."

Mental Health Problems of Immigrants and Refugees

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In recent years, Canada has become a major recipient of immigrants and refugees from around the world. However, Canada's role does not end with the arrival of its newcomers; it has the responsibility to provide for the care and well-being of new citizens so that they can become well-adjusted and productive members of society. This paper presents theories about the relationship between immigration and mental health, and discusses some of the unique problems and stresses experienced by migrant peoples. Several groups with a particularly high risk of mental health problems are identified, and suggestions for improving mental health care are proposed.

More than 100 years ago, in the 1840s, physicians noted an association between mental disorder and immigration.[1] This recognition stemmed from the observations of superintendents of the insane asylums in the United States. Many explanations for this purported association were proposed, including the suggestion that migration attracts mainly the destitute and incompetent of society, and that hard conditions of life faced by imigrants were to blame.[1]

It remains unclear whether or not migrant populations exhibit a higher rate of mental disorder than the population of the host country. Certain studies carried out in the United States have shown a higher incidence of hospitalization among immigrants when compared with the indigenous population,[2] yet some Canadian studies have demonstrated the opposite.[1,3]**

Other studies suggest that there may be a certain time period after arrival in the country of resettlement during which the immigrant or refugee is at an increased risk of developing depression and other disorders. It is generally accepted that this period does not begin immediately upon arrival in the new country, yet there is debate about when this period does occur. Some studies claim two or three months after arrival,[4,5] some state ten to twelve months later,[6] and still others suggest that the vulnerable period occurs during the second year after resettlement.[7] Although still under some dispute, it seems reasonable that immigrants could be at an increased risk of mental health problems because of the major life changes, adjustments and stresses that this segment of the population must undergo before, during, and after the process of resettlement. Refugees, who may be regarded as a "subset" or special category of immigrants, have all the concerns of other immigrant classes plus their own unique needs due to the often highly stressful and traumatic events experienced in the lands they fled.

STRESSES PLACED ON IMMIGRANTS

The types of stress faced by immigrants may be classified into pre-migration and post-migration stress.[8] Pre-migration stress is that associated with the actual process of uprooting oneself from familiar surroundings and the fear of the unknown in the adopted country. These may include events such a making preparations for leaving the old country, separation from family and loved ones, and awaiting visas which for refugees could mean an indefinite waiting period under harsh conditions in a strange third country. For example, recent Soviet Jewish immigrants to Toronto spent from one to twelve months in Italy waiting for Canadian visas to be issued.[9]

Post-migration stress occurs during the period of resettlement and acculturation in the new country, and is associated with problems the immigrant faces such as finding a job and a place to live. Two of the more devastating factors which contribute to post-migration stress are unemployment and economic deprivation.[8] Immigrants and refugees are particularly affected by these stresses because, as newcomers, they have the least tenure. Lack of employment not only means diminished financial security, but often necessitates family relocations or separations, or other family members having to enter the workforce to support the family. It is not uncommon for these newest citizens to experience a lowering of relative socioeconomic status from the level enjoyed in the old country. People who are trained as professionals may find that the only jobs available to them in the new country are in semi-skilled or even unskilled labour, such as planting crops, washing dishes or driving a taxi. This loss of status may lead to loss of confidence and self-esteem, causing great stress for the immigrant. Additional worry is created if the immigrant or refugee has come with the idea of quickly amassing

**Studies that use hospitalization statistics must always be interpreted with caution because these data merely quantify the population being admitted to hospital, presumably after having sought some help within the range of available services. This does not necessarily reflect the true occurrence of mental disorders in the population as many people with disorders may not have access to mental health care facilities, or may avoid this form of care for various reasons discussed later in this paper.

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enough money to be able to sponsor for immigration other family members in the country of origin. Financial deprivation can cause inordinate delay in achieving the goal of family reunion and lead to increased post-migration stress.

Other post-migration stresses include those associated with language difficulties and adjusting to the new culture.[10] The new immigrant faces the enormous task of learning the values of a foreign culture, adjusting to the new climate (many have never seen snow before, let alone experienced a harsh winter like those in Canada), absorbing the new language while witnessing the deterioration of the mother tongue, building up a network of friends and acquaintances, and in general working towards the goal of becoming an accepted, productive member of the new society. Any one of these stresses is hard enough to cope with separately, but the immigrant must deal with these aggravations simultaneously and present a brave front to the society at the same time. Not infrequently, officials in the new country are ignorant of the problems faced by immigrants, and of the differences between the cultures of the immigrant's country and the new country. They can often be insensitive in dealing with migrant populations.[10] It is not surprising then that migration is accompanied by feelings of loneliness, lack of a sense of belonging, insecurity and loss of self-identity.

SPECIAL NEEDS GROUPS

In 1989, the Canadian Task Force on Mental Health Issues of Immigrants and Refugees recognized several special needs groups, including children and youth, women, seniors, and victims of catastrophic stress. These groups are deemed to have special needs which require extraordinary attention. This is because they suffer marked stress, and thus have a particularly high risk for developing mental health problems. Since they tend to lack clout in society, the probability of meeting their needs is low.[11]

PROBLEMS FACED BY REFUGEES

It is generally accepted that post-migration stresses have a greater effect on the mental health of migrant populations than do pre-migration stresses. The noted exception to this rule is the case of refugees who have experienced traumatic events before emigration from their homeland.[8] Refugees are probably one group of immigrants who undergo more pre-migration stress than any other group of migrant peoples, and must often leave their homeland with little or no preparation. Many have been incarcerated in concentration camps and have experienced deprivation of food and water, lack of shelter and ill health. Refugees have often suffered imprisonment, social isolation or solitary confinement, torture, war, reeducation programmes and "brainwashing", violent sexual abuse, and being kidnapped or abandoned. Many have witnessed murder, torture or death of family members and loved ones.[12]

These and other serious traumas predispose the individual to a condition known as *post traumatic stress disorder*.[13] This disorder involves "reliving" the event through painful, intrusive recollections or nightmares lasting from several minutes to several days. Episodes are often triggered by situations that remind the person of the traumatic experience, for example, an anniversary of incarceration. The afflicted individuals may feel guilty about having survived the ordeal when others around them did not. They may experience a kind of "numbing" to disengage themselves from the painful memories. This behaviour manifests itself as emotional flatness, a decreased ability to feel pleasure for day-to-day activities, and diminished interest in other people. Sleep disturbances, sudden outbursts of rage and difficulty concentrating are associated with the condition. Anxiety and depression often occur concomitantly with the disorder.

Patients with post-traumatic stress disorder are very difficult to treat because it is hard to obtain a history of the individual's traumatic experience which is necessary for diagnosis. The recalling of traumatic events evokes painful memories and the refugee may even fear this will elicit an episode where the experience has to be endured once again.[14]

Other disorders that refugees exhibit include depression, anxiety, schizophrenia and other psychoses and suicidal thoughts.[15] Ongoing treatment is often necessary for medical disorders that are the consequences of the traumatic experiences (e.g. turberculosis, leprosy, hearing or visual impairment caused by torture.)[12]

FEMALE REFUGEES AND IMMIGRANTS

Many female refugees have been raped or sexually abused, or have lost their spouses and children to kidnapping, starvation, or violent death. One story tells of a female Vietnamese refugee who left Vietnam in a boat with 31 other persons when they were intercepted by five pirate boats.[12] She was raped by seven pirates each night for five consecutive nights. When she attempted to commit suicide by jumping into the sea, she was grabbed by her hair and rescued.

Similar horror stories exist, and one study conducted at a refugee mental health clinic in the United States showed that the clinic's Cambodian widows had higher levels of depressive symptoms than all other patients at the clinic.[12] These patients are generally hesitant to seek help for rape trauma, and the details are usually revealed through family members and friends. More research is needed into the cultural and emotional reasons for these women's reticence in order to deal more sensitively with the problems of this segment of the refugee population.

Another study has shown that among immigrants to Canada, females demonstrated a significant increase in suicide rates compared with those in their mother country, whereas immigrant males did not.[16] This suggests that migration may have more deleterious effects on females than on males. One reason put forward to explain this finding was that females are in

general less aware of and hence less prepared for difficulties they may encounter in their adopted country, because often the decision to emigrate is made by the man. Other hypotheses are that working female immigrants appear to experience a much greater decline in socioeconomic status than do males, and non-working female immigrants who are married tend to spend most of their time at home and in some cultures, are not allowed to leave the house even to attend language classes. They live a very sheltered, confining, isolating existence which may result in severe depression.

REFUGEE AND IMMIGRANT CHILDREN AND ADOLESCENTS

Children and adolescents are generally more exposed to the new culture through school and other peer groups and particularly face the dilemma of striking an appropriate balance between the old customs and traditions taught to them at home, and the values of the new culture. Sticking too closely to the ways of the old culture may create feelings of isolation, loneliness, and ineptness. On the other hand, rejecting old values completely and adopting the new culture wholeheartedly may cause alienation from the community, ambivalent feelings towards parents and family discord, thereby increasing stress. Successfully integrating old and new values is difficult, and is often the cause of emotional problems.[17]

Learning a new language also poses difficulties for children. "Elective mutism", where children hardly speak a word, for example for fear of ridicule, is not uncommon among immigrant children.[9] However, children do manage to learn the new language faster than their parents do, because of the continuous day-to-day exposure they have. This places the child in the dominant role in the family as guide and interpreter for his elders. In some cultures, children are not given as much freedom and authority as they have among Western cultures. Therefore, suddenly being thrust in a leadership role in the family can lead to much stress for the child, and intergenerational conflict.[17] The child may begin to view his parents as ignorant, out of touch and an embarrassment, and hence as poor role models. As a result, the child may develop problems with identity development, exacerbating the conflict with the parents as the child attempts to reach for better role models in the new culture.[17]

Refugee children from two years to ten years of age may have partial memories of traumatic events that occured to them before coming to the new country. Problems such as hallucinations, psychosis, depression, disruptive or aggressive behaviour, and agitation are sometimes seen in school-age refugee children. In addition, somatic manifestations of emotional problems may be seen, such as headaches.[17]

In some cultures, the concept of adolescence does not exist, and adulthood simply begins at puberty. (This belief is held among the Hmong, Meo and Yeo peoples of Laos.) These young adults are expected to perform adult duties such as minding younger siblings, going to war or becoming primary wage earners. As a result, many apsects of their emotional, educational and sexual awareness are "put on hold" because of the more pressing duty to the family. Once in the country of resettlement, these youths may feel unprepared to act as adults in the new society, yet unable to go back and resolve all the aspects of their development that were temporarily postponed. These conflicts may result in emotional difficulties and behavioral disturbances, sometimes indicating mental illness.[17]

One study on late adolescent-early adult immigrant students in Israel likened the process of immigration to a loss or separation.[18] The study noted feelings of sadness, loneliness and of being out of touch with reality in these students, almost as if they were in mourning. Varying degrees of depressive symptoms, including sleeplessness and lack of appetite were observed along with behavioral disturbances such as substance abuse, gambling and sexual promiscuity.

The authors describe a set psychological sequence associated with immigration, starting off with a period of excitement and denial of separation from the mother country. This is compared with the denial that people often experience as a typical initial reaction to loss of a loved one. The bereaved use "inner defensive actions" to protect themselves against the unpleasantness of acknowledging the loss. The authors view drug abuse and sexual promiscuity as being analogous "inner defensive reactions" used in coping with the losses brought about by immigration.

There are two possible outcomes: the first is acknowledgment of the "loss" once the reality of day-to-day life sets in. This is usually a favourable outcome, followed by coping behaviours, gradual adjustment to the new culture, and regaining a sense of control. The second outcome is less desirable — avoidance behaviour leading to isolation, maladjustment, and sometimes return "home" to the mother country. Regardless of the outcome, immigrants often feel as helpless as children because much of the experience they had gained in their old culture which enabled them to handle daily routines successfully, is no longer applicable. It is not uncommon for immigrants to suffer acute loss of self-esteem, and stop seeing themselves as confident and capable individuals. It is in this situation that immigrant students are particularly vulnerable, because just at a time when they want to test their adulthood and independence, they are made to feel helpless and dependent again. This may lead to anger and depression.[18]

THE ELDERLY

Elderly immigrants and refugees are at increased risk for developing mental health difficulties for several reasons. Seniors tend to have less ability in English and/or French than do other immigrant groups. Older persons are often less capable of adaptation to a new

society and culture than younger immigrants, because of entrenched attitudes acquired in their parent society over a prolonged period.[11] In many cultures the elderly are respected and powerful family members. However, once resettlement takes place, seniors often become financially, socially and psychologically dependent on young family members. With few peers to turn to for encouragement in the country of resettlement, the elderly must often lead very isolated lives, with no human contact except that of the immediate family.[11]

BARRIERS TO USE OF MENTAL HEALTH SERVICES

It has been found that immigrants and refugees underuse community mental health services, psychologists and psychiatrists.[9] There are several plausible explanations for this phenomenon. One is that in some cultures there is a real social stigma attached to seeking mental health care, not only for the individual, but also for the entire family. Having a "disturbed" individual in the family may affect the possibilities of future arranged marriages and similar societal interactions. Hence immigrants may seek the help of a general practitioner for somatic complaints such as backaches, headaches, abdominal pain or dizziness.[19] These symptoms are far less socially unacceptable than symptoms of mental illness. It is important to sensitize general practitioners to the fact that immigrants suffering from these and similar complaints may have deeper underlying problems that must be addressed.

Other reasons immigrants may not use mental health services are fear of deportation, lack of accessibility and previous experience of insensitivity on the part of providers of health care.[8] Dr. David Kinzie of Portland, Oregon believes that Indochinese refugees in that state avoid mental health care because health services in the United States are geared to middle-class Americans.[19] It is possible that similar observations may be made about Canadian health services.

Newcomers may find this somewhat intimidating. One way of guarding against this is through increasing awareness of health care workers to the different cultural backgrounds of immigrants and the problems they face. Time should be devoted in medical schools and other health professions to studying these issues, in order to produce well-informed practitioners in the future. □

APPENDIX

Services for Immigrants and Refugees in Nova Scotia

Non-profit organizations such as the Metropolitan Immigrant Settlement Association (MISA) and the Dartmouth Immigrant Orientation Association are run by volunteers who help with the initial adjustment to Nova Scotia life by finding housing, employment, and offering direct programmes in areas such as job re-entry and English language. Basic counselling services are available through these organizations and volunteers help families and individuals with access to community services, including health care. Persons with mental health problems of a serious nature, such as victims of torture with post-traumatic stress disorder receive psychiatric referral within the existing health care system.

The Multicultural Association of Nova Scotia (MANS) and several other ethnic and cultural associations provide social support networks for new immigrants and refugees. They also undertake projects to sensitize the community at large to multicultural issues. MANS is developing a manual for family physicians and other health professions dealing with cultural sensitivity and problems immigrants face with accessibility of health services.

The Provincial Medical Board is in the process of compiling a list of bilingual/multilingual physicians.

References

1. Murphy HBM: Migration, Culture and Mental Health. *Psycholog Med* 1977;7:677-84.
2. Lazarus J, Locke B, Thomas DS: Migration differential in mental disease. *Milbank Mem Fund Q.* 1963;41:25-42.
3. Murphy HBM: The low rate of mental hospitalization shown by immigrants to Canada. In: Zwingmann C., Pfister-Ammende, eds. *Uprooting and after.* New York: Springer-Verlag, 1975.
4. Tyhurst L: Displacement and migration: a study in social psychiatry. *Am J Psychiatr* 1951;**107**:561-8.
5. Tyhurst L: Psychosocial first aid for refugees. *Mental Health and Society* 1977;4:319-43.
6. Beiser M: Influences of time, ethnicity, and attachment on depression in Southeast Asian refugees. *Am J Psychiatr* 1988; **145**:46-51.
7. Rumbaut RD: Mental health and the refugee experience: a comparative study of Southeast Asian refugees. In: *Southeast Asian Mental Health: Treatment, Prevention, Services and Research.* DHHS Publication ADM-1399. (Owan, T., Bliatout, B., Lin K-M, et al., eds) Rockville, Md. National institute of Mental Health.
8. Beiser M: Migration and mental health. *Annals RCPSC* 1989;**22**:21-5.
9. Barankin T, Konstantareas M, de Bosset F: Adaptation of recent Soviet Jewish immigrants and their children to Toronto. *Can J Psychiatr* 1989;**34**:512-7.
10. Ganesan S, Fine S, Tsung YL: Psychiatric symptoms in refugee families from Southeast Asia: therapeutic challenges. *Am J Psychotherapy* 1989;**153**:218-28.
11. Health and Welfare Canada. *After the door has been opened: mental health issues affecting immigrants and refugees in Canada.* Report of the Canadian Task Force on Mental Health Issues Affecting Immigrants and Refugees, 1988.
12. Mollicka R, Wyshak G, Lavelle J: The psychosocial impact of war trauma and torture on Southeast Asian refugees. *Am J Psychiatr* 1987;**144**:1567-72.
13. Waldinger R *Psychiatry for medical students.* American Psychiatric Press 1984. pp. 186-7.
14. Mollicka R, Wyshak G, de Marneffe D, *et al:* Indochinese versions of the Hopkins Symptom Checklist — 25: a screening instrument for the psychiatric care of refugees. *Am J Psychiatr* 1987;**144**:497-500.
15. Flaskerud J, Nguyen TA: Mental health needs of Vietnamese refugees. *Hosp Comm Psychiatr* 1988;**39**:435-7.
16. Kliewer E, Ward R: Convergence of immigrant suicide rates to those in the destination country. *Am J Epidemiol* 1988;**127**:640-53.
17. Messer M, Rasmussen N: Southeast Asian children in America: the impact of change. *Pediatrics* 1986;**78**:323-29.
18. Mirsky J, Kaushinsky F: Psychological processes in immigration and absorption: the case of immigrant students in Israel. *JACH* 1988;**36**:329-34.
19. Kinzie J: Gold award: mental health treatment that transcends cultural barriers. *Hosp Comm Psychiatr* 1986;**37**:1144-7.

Acute Low Back Pain

A MANAGEMENT STRATEGY FOR FAMILY PHYSICIANS

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Acute, low back pain (LBP) is a disease of high prevalence in the general population and of even higher prevalence amongst specific occupations notably, nursing.[1] Because of the high prevalence in the general population, it can be questioned as to whether LBP indeed qualifies as a disease or is simply an expected deviation from the asymptomatic state in up to 80% of otherwise healthy individuals. It may therefore be inferred that back pain is not a disease but rather it is the *inability* to cope with the pain, that defines the condition and dictates the need for intervention.

Acute and chronic LBP is responsible for enormous economic losses to the individual and to the national economy. WCB claims for LBP in Canada in 1988 are estimated to amount to over a billion dollars per year, representing about 40% of the total claims paid by WCB. In Nova Scotia it has been recently reported that there have been a 37% rise in WCB claims in 1988 a significant proportion of which are due to LBP claims from hospital workers.[2] Although most of these expensive WCB claims are for chronic LBP, the effective prevention and the efficient management of acute LBP is essential to re-establish back function and possibly reduce the incidence of chronicity.

LBP has been described as the albatross of industry, the curse of the worker and the nemesis of medicine.[3] It is probably all of these things and more, Yet, although the published medical literature on LBP is abundant in volume, it is woefully short of objective studies which can withstand critical appraisal.

Most patients with LBP are successfully managed by family physicians and the problem is usually resolved at that level. Only a relatively small proportion of acute LBP cases are seen in consultation by the orthopedists or physiatrists and these are usually either the chronic cases who do not respond to standard therapy, or the acute cases where the injury is judged to be more severe than a myofascial strain or apophyseal joint disturbance.

Over the years LBP has suffered through a series of fad diagnoses from spinal distortion to disc herniation, spondylosis, apophyseal facet joint arthritis and myofascial syndrome. Currently, the body of opinion is that the cause of the majority of acute LBP is either myofascial or apophyseal facet joint disease.

In recent years, there have been several excellent controlled studies on interventions for acute LBP as seen by the family physician. There appears to be a clear advantage in early ambulation, exercise and return to work for the majority of patients.[4,5]

However, in the small minority of cases that do not do well on a simple regimen, predicting long term outcomes for patients who continue to have LBP beyond 8 weeks is in contrast, more pessimistic. This is because there are a number of complicating and confounding issues, which include:

1) High lifetime prevalence of LBP in the general population without an occupational causality.
2) Non-association of pain onset with perceived injury at the workplace in that only a small proportion of LBP results from direct injury to the back.
3) Difficulty with substantiating an exact diagnosis using basic physio-pathological concepts because physical signs are often absent. Because chronic LBP is often limited in findings to subjective symptoms, this can lead to difficulties for the family physician in deciding on the extent of disability and compensation.
4) Misunderstanding of factors leading to causation and perpetuation of symptoms is complicated by the multi-factorial etiology of LBP.
5) Confusion of chronic LBP with malingering, although only a small proportion of LBP patients have been shown to be true "malingerers".[6]
6) The role of compensation in perhaps providing less incentive for the patient with LBP to return to the workplace.

PREVENTION OF ACUTE LOW BACK PAIN

In any discussion of management, primary and secondary prevention are important and nowhere is this more true than in a discussion on the management of acute LBP.

Primary Prevention

Primary prevention involves the use of the science of ergonomics (man-machine relationships). The design of ergonomically suitable work-spaces has had a major impact on reducing the prevalence and severity of all types of work-place injuries including LBP. More specifically with respect to LBP, the design of lifting devices for inanimate objects (boxes) and animate objects (patients), orthopedically designed chairs, adjustment of workbench heights, space and foot rests, are only a few examples as to how ergonomics has been effective in reducing the incidence of LBP as well as being a boon to workers with chronic or recurrent LBP.

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Back pain sufferers need to understand and use, correct straight back/bent knee, lifting techniques where mechanical lifting devices are unavailable. However, as every nurse knows, not every injury can be prevented since no one can predict when the confused patient is going to make a sudden resistant movement as he or she is being lifted or turned, placing the nurse's lumbar-sacral spine in considerable jeopardy.

Equally difficult is the problem of selecting (or excluding) individuals for specific jobs. Again, the literature is inconclusive on the value of "pre-placement screening" techniques. X-rays of the lumbar-sacral spine have been shown to have no value and muscle-strength testing has limited value.

Secondary Prevention

Secondary/tertiary prevention in avoiding chronicity or reducing the risk of re-injuring the back, is equally important, as the strongest predictor for future back injury is the history of previous LBP. Secondary prevention of LBP can be accomplished with education, back exercise programs, a variety of lumbar support devices eg Obus Forme, and re-orientation of life and work styles. However, the necessary evidence from the medical literature which would unequivocally demonstrate the efficacy of any of these secondary or tertiary preventive techniques, is at least controversial.[7]

More optimistic is the recommended management plan for the acute episode of low back pain which can supported from evidence of proven efficacy in the medical literature.[4,5]

MANAGEMENT OF ACUTE LOW BACK PAIN

Step 1. Exclusion of "The Surgical Back"

From the recommendations listed in STEP 3 below, should be excluded any patient who is suspected of having blunt trauma to the spine where the possibility of dislocation or fracture may be a consideration. Clearly, these cases need to be transported on a spinal stretcher to a facility where the appropriate x-ray, CATscan, EMR and other diagnostic techniques are available for emergency care.

Another exclusion criteria would be the severity of the pain at the initial visit usually manifested by a markedly restricted Straight Leg Raising test, particularly where there is evidence of radiation of pain down the leg to below the knee. A consultant opinion may be sought earlier in such cases.

If there is any past history or suspicion of osteoporosis (long term steroid therapy), malignancy or previously noted back abnormalities, these too would be excluded and may dictate an early consultation.

Step 2. History and Examination

A clear history of the individual's usual and unusual activities in the preceding few days, leading to the onset of the pain, is vital in identifying the possible causal factors, which may be preventable or modifiable in the future. Not all back pain results from lifting injuries as twisting, reaching and bending alone can cause muscle tearing in a mechanically disadvantaged back. An appraisal of gait is important in determining pathology as well as assessing how well the individual is coping. A thorough examination of the spinal column, sacroiliac and hip joints, and the lower limbs for neurological deficits, is required. This physical examination includes:

- palpation of the spinous processes for tenderness or other anomalies as well as palpation of the paraspinal musculature for tenderness and spasm. Myofascial back pain will present mostly with paraspinal muscle spasm.
- palpation of the sacroiliac and hip joints for alignment and tenderness. Severe muscle spasm may cause some distortion but if present should return to normal when examined at a later follow-up visit.
- range of motion measurements of the lumbar spine will be limited in all directions with myofascial back pain, limitation of flexion will occur with disc protrusions and limitation of extension with apophyseal facet joint disease.
- straight leg raising (SLR) should not be impaired to any major degree with myofascial back pain but SLR will cause severe pain where there is nerve entrapment requiring a consultant referral.
- motor power, sensation and reflexes should all be normal in myofascial back pain (or return to normal within a few days) but remain abnormal where disc or other more serious pathology is the cause.

Step 3. Specific Recommendations

Once the exclusions have been made and the examination completed, despite the heresy implied in the statement, a definitive diagnosis is not really necessary because of the empirical nature of the role of each pathological contributing factor.[8] The purpose of the examination is to exclude other pathology and to determine the extent of dysfunction for later comparison as rehabilitation proceeds. The objective of the management plan is as always, to relieve the distress and provide early restoration of function. However it is of paramount importance that patients understand that the success of the therapy is almost entirely dependant on themselves.

1) Relief of Distress

Relief of distress is provided in two ways namely rest and analgesia. Ideally the individual with acute LBP should be given two days complete bed rest, and use an ice pack (eg. bag of frozen peas wrapped in a towel), intermittently on the painful spastic lower back for the first 24-48 hours.

Analgesia is a controversial topic and the consensus of the experts appears to be that these should be given "as needed". Specifically, the use of analgesics may vary

from ASA and acetaminophen and simple hypnotics, through the benzodiazepams and muscle relaxants, to the use of non steroidal anti-inflammatory drugs. Narcotics are hardly ever required and are probably contra-indicated. Most analgesics can be discontinued after a few days and it is seldom necessary to prescribe more than a week's supply.

2) *Early Restoration of Function*

Rapidity of rehabilitation depends to a great extent in persuading the patient to begin exercising after 48 hours of bedrest, ice and analgesia. Such exercises are very simple and include pelvic tilt, knee bending, leg bending and extension. It must be remembered that in patients with protruding disc syndromes, flexion excercises would be contra-indicated at this stage, so that if there is doubt about the exclusion of disc disease, an early consultation should be sought. Early ambulation and exercise, even though pain may still be present, are vitally important if the individual is to make an early functional, but not necessarily pain-free, return to the workplace. It is important to emphasize that pain may continue but does not indicate a more severe injury or a mis-diagnosis. The family physician should instill a positive attitude and concentrate on how well the individual is functioning rather than whether or not pain is still present or absent. Residual pain and stiffness from an acute LBP usually resolves within a few weeks *if the individual maintains their exercise program.* Excellent books written for the lay public are available and provide clear instructions about exercise programs and life style changes (posture, weight reduction, back mechanics, etc).[9,10]

If there is any difficulty in the exercise program, a physiotherapist can be most useful in teaching the exercises under supervision, and indeed should be more actively involved if improvement is delayed with the simple regimen described above.

Some industries provide "rehabilitation positions" in the workplace to allow an employee recovering from an acute back injury to return to the workplace without being immediately faced with heavy lifting or other potentially back injuring tasks during the convalescent stage. Such over-activity may potentially lead to further acute injury or chronic back pain problems. Regrettably, not all employers have accepted the advantages of having the employee return to the workplace at an early stage, reassured that they will be protected from further injury, while their back heals.

SUMMARY

The vast majority of occupational-induced acute low back pain can be effectively managed by the family physician and/or occupational health physician, with a simple regimen of limited bed rest and the use of ice packs, analgesia as required, early ambulation with simple exercises and life style modification. □

References

1. Stubbs DA, Buckle PW, Hudson MP, Rivers PM, Worringham CJ. "Back Pain in The Nursing Profession: I Epidemiology and Pilot Methodology" *Ergonomics* 1983; **26:** 755-765.
2. Collins B in "Increasing in Work-related Injuries Disturbing", a news report in *The Mail Star* dated Feb. 22, 1990.
3. Morris A, Randolph JW. "Back Rehabilitation Programs Speed Recovery of Injured Workers" *Occup Hlth & Saf* 1984; **5:** 53-58.
4. Gilbert JR, Taylor DW, Hildebrand A, Evans C. "Clinical Trial of Common Treatments for Low Back Pain in Family Practice". *Br Med J* 1985; **291:** 789-790.
5. Deyo RA, Diehl AK, Rosenthal M. "How Many Days for Acute Low Back Pain?" *New Engl J Med* 1986; **315:** 1064-1070.
6. *Back Pain Monitor,* 1984 February; Vol 2 #2.
7. Singer J, Gilbert JR, Hutton T, Taylor DW. "Predicting Outcome in Acute Low Back Pain" *Can Fam Phys* 1987; **33:** 655-659.
8. Hall H. "Conservative Management of Low Back Pain" *Medicine North America* 1988; **26:** 4905-4915.
9. Livingstone M. *Beyond Backache — A Personal Guide to Back and Neck Pain Relief* Libra Publ. California, 1988.
10. Hall H. *More Advice From the Back Doctor* Toronto: McClelland and Stewart, 1987.

HEART DISEASE RISK FACTORS IN HALIFAX CO.

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References

1. Kannel WB, Dawber TR, Kagan A, Revotskie N, Stokes JI. Factors of Risk in the Development of Coronary Heart Disease — Six Year Follow-up Experience: The Framingham Study. *Ann Intern Med* 1961;55:33-50.
2. Kannel WB, Gordon T. *The Framingham Study.* Washington DC: U.S. Dept. HEW Public Health Service NIH, 1976.
3. The Pooling Project Research Group. Relationship of Blood Pressure, Serum Cholesterol, Smoking Habit, Relative Weight and ECG Abnormalities to Incidence of Major Coronary Events: Final Report of the Pooling Project. *J. Chron Dis* 1978;31:201-306.
4. Keys A. *Seven Countries — A Multivariate Analysis of Death and Coronary Heart Disease.* Cambridge Mass.: Harvard University Press, 1980.
5. WHO MONICA Project Principal Investigators. The World Health Organization MONICA Project (Monitoring Trends and Determinants in Cardiovascular Disease) — A Major International Collaboration. *J Clin Epidem* 1988;41:105-114.
6. The Principal Investigators of the MONICA Project. WHO MONICA Project: Geographic Variations in Mortality from Cardiovascular Disease — Baseline Data on Selected Population Characteristics and Cardiovascular Mortality. *Wld Hlth Statist Quart* 1987;40:171-184.
7. The WHO MONICA Project. Geographic Variations in the Major Risk Factors of Coronary Heart Disease in Men and Women Aged 35-64 years. *Wld Hlth Statist Quart* 1988;41:115-140.
8. Hoyt BK, Wolf HK. An Electronic Instrument for Indirect Blood Pressure Measurement. *Lancet* 1984;II:552-553.
9. Engel LW, Strauchen JA, Chiazze L, Heid M. Accuracy of Death Certification in an Autopsied Population with Specific Attention to Malignant Neoplasms and Vascular Diseases. *Am J Epidem* 1980;111:99-112.
10. Harveit F. Clinical and Post-Mortem Assessment of the Cause of Death. *J Pathol* 1977;123:193-210.
11. The Canadian Consensus Conference on the Prevention of Heart and Vascular Disease by Altering Serum Cholesterol and Lipoprotein Risk Factors: Canadian Consensus Conference on Cholesterol: Final Report. *Can Med Assoc J* 1988;139 Suppl(11):1-8.

Current Topics in Community Health

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This special Community Health issue features selected public health papers from First Year Students at Dalhousie Medical School.

HEALTH EFFECTS OF SHIFT WORK

Kelly Laurence, BSc

Statistics indicate that the number of workers involved in shift work has increased steadily over the past 30 years. It is now estimated that between 15 and 25 percent of the work force in Western industrial countries is engaged in shift work.[1] The reasons for the increase are three-fold. First, there has been an increased social demand for twenty-four hour services, for example medical care, transportation and security; second, technological changes have led to more continuous process operation; and third, economic factors force the optimal use of invested capital.[2]

Many health problems have been associated with shift work. The problems arise partly from the fact that the body's sleep/wake cycle and other circadian rhythms are disrupted when a person is required to work nights or rotate between shifts. Experiments have suggested that it takes time for human circadian rhythms to readjust after time shifts of 6-8 hours. Therefore, rhythms may be out of phase with the new sleep/wake cycle for a period of time after the shift. The shift worker may therefore experience lack of synchronicity between the various bodily rhythms as well as a desynchronization from the external environment because he may be forced to perform tasks at an inappropriate time relative to his internal body clock.[1]

Perhaps the worst effect of shift work is disturbed sleep. People working night shifts sleep less and report poorer sleep quality during daytime sleep than their daytime work counterparts.[3] Shift work demands that a person sleep when the body clock may make it difficult to do so or when sleep may be cut short, as before an early morning shift. As a result shift workers commonly suffer from chronic fatigue and decreased well-being.[4]

Research indicates long-term shift work disturbs gastrointestinal function[5] and suggests that workers are more prone to upper respiratory infections.[6] A recent study of 504 papermill workers showed an association between shift work and increased risk of ischemic heart disease.[7]

Shift work can also be detrimental to the social and family lives of workers. The abnormal work hours result in less useful free time for family and friends. The fact that the spare time of these workers does not coincide with that of family and friends is thought to contribute to the fatigue, irritation and aggression reported by shiftworkers.[5]

A combination of approaches could minimize the effects of shift work. Not all shiftworkers suffer from problems (some find it easier than others to ignore their body clock and to sleep at odd times and are less likely to suffer from the medical and social complaints associated with shift work). Therefore, a test to predict tolerance to shift work would help reduce associated problems.[8] In a study of mill workers to determine risk of ischemic heart disease, there was a remarkable fall in risk beyond 20 years of exposure to shift work. One explanation for this is that positive selection had taken place; that these workers were better suited to shift work than the others.[7]

Shift schedules which would reduce detrimental effects could also help, and a great deal of research has centred on the effects of different shift schedules on circadian rhythms. One study of subjects with different circadian positions showed that evening workers were able to adjust their circadian system to a slowly rotating shift system (rotation speed seven days) but that they had difficulty in adjusting to a shift system involving faster rotation.[9] Studies have also shown however, that adjustment to daytime routine is very rapid so unless workers remain on a nocturnal routine during days off, any adjustment which may have occurred is lost. The result of this is a cumulative sleep debt of up to two nights over the course of a week of night shifts. Thus shift workers will be trying to work when they are in a relatively sleep deprived state.[8]

Alternatively, sleep debt can be reduced by limiting the number of successive nights in a shift schedule. The compromise is that no adjustment will have occurred and individuals will be working at a low ebb.[8]

Another factor thought to be important is the direction of rotation of the shift, ie. advancing (mornings-nights-afternoons) or delaying (mornings-afternoons-nights). The body clock has a natural period of 25 hours. It is felt by many that a delaying schedule is handled more easily by the body because the delay forces the body clock to run with a period of more than 24 hours. There is some experimental evidence to support this; however, the theory is still controversial.[1]

A third factor in designing shift schedules is the timing duration of shifts. Morning shifts should not start too early since sleep debt can occur on the morning shift if workers go to bed at their normal time despite having to get up two or three hours earlier than normal. It may in fact be futile for them to go to bed earlier than normal because research suggests they would not be able

to sleep because of their body clocks. Long shifts can also result in high fatigue levels. Hence the implications of the 12 hour shift deserve careful consideration from both a health and safety standpoint.[8]

In the short term, changes in lifestyle may reduce the stress of shift work.[6] Relaxation exercises and regular aerobic exercise can both be helpful. Diet is important too, and the last meal of a shift worker's day should contain more complex carbohydrates than protein. Caffeine and alcohol should be avoided because both interfere with sleep patterns. Keeping noise and light in the sleeping environment to a minimum is often suggested, but it should be noted that internal not external factors are the chief causative factors.[5] Phoning home each night to talk to family members is important in maintaining communication and reducing the alienation the shift worker may feel.

Finally, non-monetary compensation to offset the negative effects of shiftwork needs consideration.[10] For example, work hours per week could be reduced to shorten exposure to the unhealthiness of the shift work situation and an age limit for shift work could be established, including earlier retirement, since the dysfunctions and symptoms related to shift work increase after the age of forty-five.[5]

References

1. Turek F: Circadian principles and design of rotating shift work schedules. *Am J Physiol* 1986;**251**:R636-8.
2. Johnson, Tepas, Colquhoun, Colligan, eds. *The Twenty-Four Hour Workday: Proceedings of a Symposium on Variations in Work-Sleep Schedules*, NIOSH, 1981: iii.
3. Colquhoun WP: Shiftwork Discussion and Conclusion. *The Twenty-Four Hour Workday: Proceedings of a Symposium on Variations in Work-Sleep Schedules*, NIOSH, 1981:755-61.
4. Verhaegen, Massesn, Meers. Health Problems in Shiftworkers. *The Twenty-Four Hour Workday: Proceedings of a Symposium on Variations in Work-Sleep Schedules*, NIOSH, 1981:335-46.
5. Erogberg JE: Shift Work and Irregular Working Hours in Sweden: Research Issues and Methodological Problems. *The Twenty-Four Hour Workday: Proceedings of a Symposium on Variations in Work-Sleep Schedules*, NIOSH, 1981:289-301.
6. Pare M: Shift work may be hazardous to your health, doctors warned. *Can Med Assoc J* 1989;**141**:243-5.
7. Kuntsson, Akerstedt, Jonsson, Orth-Gomer: Increased risk of ischaemic heart disease in shift workers. *Lancet* 1986;**ii**:98-92.
8. Folkard S: Shift work — a growing occupational health hazard. *Occ Health* 1989;**41**:182-4.
9. Moog R: Optimization of shift work: physiological contributions. *Ergonomics* 1987;**30**:1248-59.
10. Thierry H: Compensation for shift work: a model and some results. *The Twenty-Four Hour Workday: Proceedings of a Symposium on Variations in Work-Sleep Schedules*, NIOSH, 1981, 375-91.

HIV TRANSMISSION THROUGH ORGAN AND TISSUE TRANSPLANT

Sheela Bhattacharyya, BSc

The acquired immunodeficiency syndrome or AIDS is caused by a retrovirus known as the human immunodeficiency virus (HIV). The virus destroys the body's immune system and is transmitted through blood and body fluids.[1] After the discovery of AIDS in those who had received blood transfusion, concern was raised with respect to the possibility of HIV transmission through organ and tissue transplantation.[1]

In Canada in 1987 over 100 transplants of perfused organs, including kidney, heart/lung, liver and pancreas and almost 2000 corneal transplants were performed. Data for other non-perfused tissues such as bone and skin are not available except for bone marrow where 1984 figures show that 123 such transplants took place.[1] This recipient population as well as women utilizing donor insemination programs are considered to be at risk.

According to Rubin *et al.*, there is now compelling evidence that primary infections with HIV can occur during the course of transplantation.[3] Though no such cases have been reported in Canada, HIV infection has been found to occur in recipients of organs from both living-related and cadaveric donors.[1,2] The best documented cases of transmission to a seronegative recipient through a seropositive donor have been in kidney allografts, where seven patients developed seroconversion.[5] Cases involving liver, heart, skin, and bone marrow transplants have also been documented although more rarely. Six cases involving donor insemination have been recorded from Australia and Canada.[1] In those instances where seroconversion has occurred as a result of transplantation, overt AIDS has developed as soon as 4 months and as late as 2-3 years following transplantation.[2]

Despite the fact that HIV has been found to exist in tears, cornea, and conjunctival epithelium, no cases of HIV transmission have been reported from patients who have received corneas from HIV-positive donors. However, HIV may be a neurotropic virus and such viruses have been transmitted by corneal transplantation.[6] This fact, coupled with the number of corneal transplants performed each year, makes this area of research of great clinical significance.

In 1989, the Federal Centre for AIDS' Working Group on HIV Infection in Organ and Tissue Transplantation proposed a list of guidelines to prevent transmission of HIV during transplantation. The approach involves multifaceted screening, where in addition to the regular serological screening, donor suitability is determined by physical and personal history as well as a complete epidemiological history. The guidelines, in the form of 12 recommendations, are to be implemented with regards to local statutes.

In the instance of bone transplants, where there are months between procurement and clinical use, Buck *et al.* have determined such multifaceted screening can reduce the risk of processing bone from an unrecognized HIV carrier to less than one in a million.[4] If however, serological testing for HIV antibody is the only screening technique used, the risk of infection from an HIV infected donor increases dramatically to a possible 1:161.

For the transplantation of vital organs, where organs cannot be quarantined for at least 6 months, perhaps the best method of prevention under normal circumstances

should be exclusion of all donors from potential high risk populations.

References

1. Guidelines for Prevention of HIV Infection in Organ and Tissue Transplantation. *Can Dis Wkly Rep* 1989;15s4.
2. Rubin RH, Jenkins RL, Shaw BW, *et al*: The Acquired Immunodeficiency Syndrome and Transplantation. *Transplantation* 1987;**44**:1-4.
3. Dummer JS, Erb S, Breinig MK, *et al*: Infection with Human Immunodeficiency Virus in the Pittsburgh transplant population. *Transplantation* 1989;**47**:134-139.
4. Buck BE, Malinin TI, Brown MD: Bone transplantation and Human Immunodeficiency Virus. *Clinical Orthopedics* 1989;**240**:1129-136.
5. Gottesdiener KM: Transplanted infections: donor-to-host transmission with allograft. *Ann Int Med* 1989;**110**:1001-1016.

ANABOLIC STEROIDS: EDUCATION AND REGULATION THE KEY

Warren Shih, BSc

Little is known about the prevalence of anabolic steroid use in our society. Public attention only began to focus on the problem following the disqualification of Ben Johnson, winner of the gold medal for the 100 meter dash in the 1988 Olympic Games.

The use of steroids to enhance performance is not new. As early as the 1952 Winter Games in Oslo, there were reports of hypodermic needles and empty ampules found in locker rooms. The 1976 Summer Games in Montreal marked the first testing for anabolic steroids; 8 of 275 samples tested positive.[1]

Anabolic steroids are synthetic androgens having greater anabolic activity relative to androgenic activity than testosterone. They have legitimate use in several conditions such as the treatment of male hypogonadism. Use by athletes to enhance performance is based on the belief that steroids increase body mass, muscle tissue, strength and aggressiveness. Comprehensive studies have concluded that it is unclear whether steroids actually enhance performance as the studies do not follow drug doses and regimens commonly used.[2] With athletes taking up to 1000 times the recommended dose and "stacking", the practice of taking different steroids at the same time, it is unlikely researchers will ever determine what are the true effects.[3]

Steroid use poses clear adverse effects such as hepatic abnormalities,[2] sterility,[4] and cardiovascular disease.[5] As well, increased aggression and violence has been associated with steroid use.[6] Commonly known as "roid rage", this has led to many convictions for violent crimes including murder.[7]

Steroid use is particularly common among athletes in strength sports such as weightlifters, bodybuilders, football players, and track and field athletes.[8,9] Steroid use has been seen from the professional and world class amateur levels, through collegiate and even at the high school level.[10,11] Neither is it only limited to competitive athletes. Some college students have cited personal appearance as the principle reason for using steroids.[11]

The key to prevention of anabolic steroid use is education.[8,9,12] This would involve a wide dissemination of information on adverse health consequences and the issue of performance enhancement versus long term health problems. This program should be aimed not only at athletes of the present but also of the future. It should become part of the education system and begin at an early age as future athletes are shaped in childhood. Physicians, already an integral part of most sports programs, would also play a role in the effort. Professional and world class amateur athletes would serve ideally as models for the younger athlete.

However, even educated athletes will put themselves at great physical risk to gain a competitive advantage. Thus, strong enforcement by the regulatory bodies in the various sports is also necessary. Testing for steroid use should occur not only after events, but also during training as athletes use steroids in cycles so that they are off steroids during the months prior to competition.[9] Off-season testing should also be random and on short notice.

Another key to intervention is tighter control on the distribution of anabolic steroids. Distribution of steroids to athletes has been reported to be 85-100% through the black market.[13] Thus tighter control is necessary. Only by reaching an agreement worldwide on intervention can this problem be truly fought. Tight regulation of steroid distribution in one country does not prevent athletes from tapping black market steroids from other nations. As well, if one athlete gains a competitive edge through steroids it will drive others to do it. Today the concept of sports as fun has been superseded by sports as business. Young athletes are drilled to win at all costs and when it comes down to winning and money versus health there will always be those willing to take the risk. Thus for many, steroids are just a natural step on their route to success.

References

1. Cowart VS: State of art drug identification laboratories play increasing role in major athletic events. *JAMA* 1986;**256**:3068-9, 3073-4.
2. Wilson JD: Androgen abuse by athletes. *Endocr Rev* 1988;**9**:140-9.
3. Cowart VS: Accord on drug testing, sanctions sought before 1992 Olympics in Europe. *JAMA* 1988;**260**:3397-8.
4. Limbird TJ: Anabolic steroids in training and treatment of athletes. *Compr Ther* 1985;**11**:25-30.
5. McNutt RA, Ferenchick GS, Kirlin PC, Hamlin NJ: Acute myocardial infarction in a 22 year old world class weight lifter using anabolic steroids. *Am J Cardiology*1988;**62**:164.
6. Pope HG, Katz DL: Affective and psychotic symptoms associated with anabolic steroid use. *Am J Psychiatry*1988;**145**:487-90.
7. Lubell A: Does steroid abuse cause or excuse violence? *Phys Sportsmed* 1989;**17**:176-80.
8. Council on Scientific Affairs. American Medical Association: Drug abuse in athletes: Anabolic steroids and human growth hormone. *JAMA* 1989;**259**:1703-5.
9. Hallagan JB, Hallagan LF, Snyder MB: Anabolic-androgenic steroid use by athletes. *N Engl J Med*1989;**321**:1042-5.
10. Harvey JS: Steroids: not just for athletes anymore. *Phys Sportsmed* 1986;**14**:48.
11. Pope HG, Katz DL, Champoux R: Anabolic androgenic steroid use among 1010 college men, *Phys Sportsmed* 1988;**16**:756-77, 80-81.
12. Cowart VS: Issues of drugs and sports gains attention as Olympic Games open in South Korea. *JAMA* 1988;**260**:1517-8.
13. Taylor WN: Synthetic anabolic-androgenic steroids: a plea for controlled status. *Phys Sportsmed* 1987;**15**:140-9.

ENVIRONMENTAL TOBACCO SMOKE

Simone Tran, BSc

Environmental tobacco smoke (ETS) consists of mainstream smoke inhaled and exhaled by the smoker, sidestream smoke from the end of a burning cigarette, and vapour phase components diffusing through the cigarette paper. The majority of passive exposure is the result of sidestream smoke, making up about 85% of ETS, while the rest is from mainstream smoke.[1]

Sidestream smoke is the main source of carcinogens in ETS.[2] It does not differ qualitatively from mainstream smoke but it may have higher concentrations of certain constitutents (eg, carbon monoxide concentration is 2.5 times higher in sidestream smoke).[2] The concentration of ETS is dependent upon the amount of smoke generated, the volume of ambient air, and the amount and type of ventilation present.[2] Although one can determine the amount of tobacco smoke present in the air, it is more difficult to assess the amount of constituents being absorbed by the non-smoker.[2]

Only within the past decade or so have adverse effects been associated with passive smoking. One study from Washington County, Maryland, revealed that non-smokers living with smokers had an increased risk of death from all causes; and that the relative risk was similar to pipe or cigar smokers.[3] However, the study failed to prove that the increased risk was the result of passive smoke exposure or the result of changes in lifestyle. Nevertheless, there have been other reports linking tobacco smoke to sensory irritations, acute and chronic changes in cardio-respiratory functions, and lung cancer.[1,4,5]

Cardiovascular disease has been strongly associated with active smoking but evidence to support a similar relationship with passive smoking is scarce. Several studies measuring the relationship between acute cardiovascular changes and ETS have shown mixed findings. There is some uncertainty as to whether involuntary smoke exposure leads to increased blood pressures and heart rates in adults and children at rest or in exercise.[4,5]

This situation is more clear cut with respect to respiratory symptoms. The acute effects of cigarette smoke upon the airway tracts include: 1) decreased function of cilia lining airways; 2) increased mucous production from bronchial lining; and 3) varied amounts of bronchospasm.[4] As a result of these changes, prolonged exposure can lead to an increased risk of upper respiratory infections or chronic bronchitis in adults. Infants and children of parents who smoke are even more susceptible, being twice as likely to develop bronchitis or pneumonia in the first year of life than those of non-smoking parents.[1,5] Finally, although not fully established as causal, passive smoking has been linked to lung cancer.[1,4,5]

There are three possible strategies that could be implemented to resolve the health problem of passive smoking.[4] The first plan is to provide improvements to room and building ventilation. However, in order for it to be effective, the continuous energy expenditure of up to 0.7kW/smoker would be needed.[4] Considering Canada's energy shortage, ventilation would be a very costly and highly impractical measure of prevention.

The second means of prevention can involve voluntary restrictions upon tobacco smoking. However enforcing such restrictions without legal action is very difficult. Unless there are strict reinforcements such as heavy fines, these types of restrictions will continually be ignored. Voluntary smoking restrictions are no exception. About a decade ago, a survey in Toronto illustrated the frequency of smoking restriction violations.[4] Approximately 27% of the non-smokers surveyed requested a smoker to stop smoking in a non-designated area. Fortunately, today many smokers are in favour of increasing the number of non-smoking areas in public facilities.[4,6,7] This suggests that voluntary non-smoking policies set up in the workplace may have a chance of success.

Probably the most effective means of preventing further tobacco smoke pollution is through legislation. The prevalence of smoking is rapidly declining amongst older smokers in Canada but an alarming 50% of people 20-29 years of age still smoke.[8] To prevent further ETS-related health problems in the future, enforcement should be aimed at the younger population. One example is to legislate tighter restrictions prohibiting tobacco sales to minors. This would be very effective if strictly enforced.

Perhaps, the law recently passed in June of 1988 — the Tobacco Products Control Act — will be more effective in curbing the prevalence of smoking and thus ETS.[9] By 1991, all advertisements related to tobacco products will be banned from Canadian newspapers and magazines, and also from endorsing any sporting or cultural event. In addition, all cigarette packages will have warning labels indicating the hazards of ETS on others. In other countries where tobacco advertising bans are in effect, declines in teenage smoking have been observed.[9] Government officials hope to see the same in Canada despite the fact that 75% of magazines sold are US publications which allow tobacco ads.

Legislation can also be effective in protecting the non-smoker and minimizing exposure to ETS. Both the Canadian and the US governments have implemented strict policies which limit smoking to closed-off designated areas in government workplaces, cafeterias and health care facilities.[4,6] Also, smoking cessation programs have been offered in conjunction with these restrictions. This may be a major step in eliminating passive smoking from all work settings and eventually all public places.

References

1. Byrd JC, Shapiro RS, Schiedermayer DL: Passive smoking: A review of medical and legal issues. *Am J Pub Hlth* 1989;**79**:209-15.
2. US Department of Health and Human Services: *The Health Consequences of Smoking: Cancer. A report of the Surgeon General* 1982, DDHS (PHS) 82-50179. Rockville, MD.

3. Sandler D, Comstock G, Helsing K, *et al*: Deaths from all causes in non-smokers who lived with smokers. *Am J Pub Hlth* 1989;**79**:163-167.
4. Shephard RJ: *The Risks of Passive Smoking*. London: Croom Helm Ltd. 1982.
5. Committee on Passive Smoking, National Research Council (US). *Environmental Tobacco Smoke. Measuring Exposures and Assessing Health Effects*. Washington, DC: National Academy Press.
6. Millar WJ: Evaluation of the impact of smoking restrictions in a government work setting. *Can J Pub Hlth* 1988;**79**:379-82.
7. Sorenson G, Pechacek TF: Implementing non-smoking policies in the private sector and assessing their effects. *NY State J Med* 1989;**89**: 11-5.
8. Mao Y, Morrison H, Nichol RD, *et al*: The health consequences of smoking among smokers in Canada. *Can J Pub Hlth* 1988;**79**;390-1.
9. Steinberg K: Canada severely limits means for conveying tobacco companies' messages to potential users. *JAMA* 1988;**260**:2480-1.

LYME DISEASE

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Lyme disease was first recognized in 1975 in Lyme, Connecticut as an unusual concentration of oligoarticular arthritis in children and adults.[1] The deer tick *Ixodes dammini* is the primary vector, which the disease having a spirochetal etiology—*Borrelia burgdorferi*.[2,3] The primary host of *Ixodes dammini* and the reservoir of *Borrelia burgdorferi* is the white-footed mouse. The disease typically begins in the summer (coinciding with both vector and human activity) and presents often with the unique skin lesion *erythema chronicum migrans*.[4] If unrecognized and undiagnosed, Lyme disease can lead to widely varying symptoms (eg, heart block, meningoradiculoneuritis, dementia) so that is has been called the new "Great Imitator" of diseases of the nervous system.[5]

In Canada, several species of ticks capable of transmitting *B. burgdorferi* have been identified[6] and the incidence of locally acquired Lyme disease appears to be on the rise.[7]

Of the 30 cases reported in Canada to the end of 1988, 25 were thought to have been acquired locally.[6] The majority of these (17/25) were recorded in Ontario followed by Manitoba with 5/25.[7] It is not surprising that this distribution should occur, considering that these provinces border on states with a high incidence of Lyme disease.[8]

Once identified, Lyme disease can be treated usually successfully with antibiotic therapy — generally with complete reversal of symptoms in early stages and complete or partial reversal if the disease has progressed to a later stage.[5] Nonetheless, prevention is important.

The most successful preventive approach has been to educate both the public and medical professionals in endemic areas such as the the US on both the signs and symptoms of infection, as well as on personal protective strategies. The latter include avoiding particular areas such as brush-covered deer infested and/or secondary successive sites at certain times of the year, particularly June, as well as periodic personal inspection, the use of deet insect repellant, and the use of protective clothing when avoidance is not possible.[9]

Other approaches are aimed at controlling the populations of deer ticks. Chemical control has been used with some success, although coverage of large areas and periodic reappearance of infected ticks appear to be problematic.[10] Destruction of deer populations, on which *Ixodes dammini* is dependent for reproductive purposes, is not politically or ecologically acceptable, although tick populations have been shown to be dependent on deer density.[11]

A third strategy calls for the dispersal of plastic tubes containing treated cotton batting.[10] The treated cotton would be actively harvested by the white-footed mouse, the reservoir of *B. burgdorferi*, for nesting material. *Ixodes dammini* larvae and nymphs so exposed to this nesting material would be poisoned. Although work remains to be done on this intervention, it has shown promise.[10]

References

1. Steer AC *et al:* A cluster of arthritis in children and adults in Lyme, Connecticut. *Arthritis Rheum* 1976;**19**:824.
2. Steer AC *et al:* Cases of Lyme disease in the United States: Locations correlated with the distribution of *Ixodes dammini*. *Ann Int Med* 1979;**91**:730.
3. Steer AC *et al:* The spriochetal etiology of Lyme disease. *N Engl J Med* 1983;**302**:733.
4. Steer AC *et al: Erythema chronicum migrans* and Lyme arthritis: The enlarging clinical spectrum. *Ann Int Med* 1977;**86**:685.
5. Pachner AR: *Borrelia burgdorferi* in the nervous system: The new "great imitator". *Ann NY Acad Sci* 1988;**539**:56.
6. Epidemiologic Report: Lyme disease in Canada. *Can Med Assoc J* 1988;**139**:233.
7. Todd MJ: Lyme disease in Canada — 1989 update. *Can Dis Wkly Rep* 1989;**151**:135.
8. Lyme Disease — United States. 1987 and 1988. *MMWR* 1989;**38(39)**:668.
9. Spielman A: Prospects for suppressing transmission of Lyme disease. *Ann NY Acad Sci* 1988;**539**:212.
10. Schulze TL et al: Vector tick population and Lyme disease. *Ann NY Acad Sci* 1988;**539**:204.
11. Speilman A: Ecology of *Ixodes dammini*-borne human babesiosis and Lyme disease. *Ann Rev Entomol* 1985;**30**:439.

EPIDEMICS OF PARALYTIC POLIOMYELITIS IN VACCINATED POPULATIONS

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Poliomyelitis is an acute viral disease caused by one of three related poliovirus serotypes. It can occur sporadically or in epidemics and is characterized by fever, sore throat, headache, vomiting, and often stiffness in the neck and back. The disease may result in paralysis and subsequent atrophy of muscles affected, ending in permanent disability and deformity. Death can result from respiratory paralysis.[1]

The World Health Organization (WHO) estimated that, in 1986, 250,000 cases of paralytic poliomyelitis occurred worldwide that year.[2] However, the disease has been largely eliminated in most developed countries since the advent of the inactivated poliovirus vaccine (IPV) in 1955 and the attenuated oral poliovirus vaccine (OPV) in 1961.[2]

Despite the remarkable success of the vaccines by those countries using them, recent poliomyelitis epidemics in Finland and Israel emphasize the importance of maintaining and monitoring the vaccination strategies currently in use.

In the District of Hadera (populations 180,000) located in Israel, 12 people were diagnosed with paralytic poliomyelitis in 1988. Three other people outside Hadera were also diagnosed.[3] The type I virus was isolated in eight of these people.

Israel began using IPV but then switched to OPV in 1961. OPV was given in four doses before two years of age, starting at two months. However, Israel still retained an average 14 cases per year up to 1981, with the district of Hadera being the highest. In Hadera, and 15 other districts, a new more potent IPV was put into use. Between 1981 and the 1988 epidemic, fewer than two cases per annum were reported. Interestingly, none of those people afflicted during the 1988 epidemic had received the new IPV.[3]

An epidemic occurred in Finland between October 1984 and January 1985. Nine cases of paralytic poliomyelitis and one case of aseptic meningitis were diagnosed during this period. Finland had been using IPV since the early 1960s and had not had a single case of poliomyelitis until the 1984 epidemic. All but three of those affected had received three to five doses of IPV prior to the onset of the disease,[4] and based on stool samples, it was estimated that up to 100,000 persons were infected with the type 3 virus.[5]

The vaccination schedule in Finland starts later than that used in Canada, with doses given at five and six months of age, at two years, plus boosters at 6, 11 and 16 years of age.[4] Vaccinations in Finland reached the entire population in the early 1970s, with an estimated 99% of the population receiving at least two doses of IPV. This may have declined to a low of 78% in 1983.[4]

The epidemic was stopped by giving an extra dose of IPV from November 1984 to February 1985, followed by a single dose of OPV offered after March 1985. An estimated 94% of the 4.3 million population was contacted. The new IPV has since replaced the IPV in Finland.[4]

In North America, two epidemics have occurred in the past 20 years. In 1972, a type I poliovirus epidemic occurred in a private Christian school in Greenwich, Connecticut. Eleven individuals were affected, ten of whom had no history of vaccination. In 1978, a visiting Protestant group from the Netherlands brought epidemic disease to their religious counterparts in Canada and the US. The result was six cases in Canada and 13 in the US. These groups had declined vaccinations because of their religious beliefs.[6]

The two epidemics in North America (in 1972 and 1978) are easily explained as they occurred in unvaccinated populations.

The most probable cause of the Finnish epidemic is a combination of a poor vaccine and a mutated virus. The theory of a vaccine of inadequate potency which failed to supply the population with adequate immunity is supported by the fact that neighbouring Sweden, which uses a different IPV, remained free of poliovirus.[4] The nucleotide sequence of the poliovirus isolated during the epidemic showed large changes in the regions coding for major antigenic sites.[7] This may have provided a means to let the virus escape the Finnish population's immunity.[6]

The outbreak in Israel was probably also caused by an ineffective old IPV which failed to prevent the disease in those who hadn't received the new IPV.

The use of IPV has risks (although small) as seen in Finland and in Israel, with possible breakthroughs by the virus. The OPV provides better immunity, but also has an associated risk of paralysis (0.14 cases per million doses).[8] It is suggested that the newer more potent IPV be implemented in vaccine campaigns.[6]

Due to the low occurrence of poliomyelitis today, North America countries may have a tendency to grow complacent in monitoring the effectiveness of the poliovirus vaccines. To prevent future tragedy, vigilance must be maintained.

References

1. Taylor EJ (ed): *Dorland's Illustrated Medical Dictionary*, 27th edition, WB Saunders Co., Philadelphia, 1988.
2. CDC: Progress toward eradicating poliomyelitis from the Americas. *JAMA* 1989;**262**:1443-53.
3. CDC: Poliomyelitis-Israel, *MMWR* 1988;**37**:624-5.
4. Furesz J: 1986, Poliomyelitis revisited: Outbreak in Finland. *Can Dis Wkly Rep*1984-1985;**12**:117-9.
5. CDSC Report: Outbreak of poliomyelitis in Finland, *Br Med J* 1985;**29**:41-2.
6. Morrison EG, Embil JA: Poliomyelitis in North America: The disease is not dead yet. *Can Med Assoc J* 1987;**137**:1085-7.
7. Hughes PJ, Evans DMA, Minor P, *et al*: The nucleotide sequence of a type 3 poliovirus isolated during a recent outbreak of poliomyelitis in Finland. *J Gen Virol* 1986;**67**:2093-2102.
8. Esteves K: Safety of oral poliomyelitis vaccine: Results of a WHO enquiry. *Bull WHO* 1988;**66**:739-746.