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GUEST EDITORIAL

The Doctor as a Gate

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In a precedent setting decision, the British Columbia Medical Association has just agreed to repay almost $12,000,000.00 to the Provincial Government because of "over utilization" of the health services of that Province. Dr. David Jones, the new BCMA President, is quoted as saying that "patient induced demand is the cause and they want us to control that".[1] In Quebec, doctors are allowed to bill to a quarterly figure after which no further monies are paid for patient services. In general across Canada, doctors are faced with bed shortages, nursing shortages, equipment requests denied, and long wait lists for surgery.

A recent media-sponsored symposium on health care costs was distinguished by the lack of professional involvement and a preponderance of health care economists.[2]

The finger has been pointed to explain the ever increasing costs of health care in all Western societies, and this has clearly come to rest against the medical profession. Are doctors now expected to police patient entry and utilization of the health care system, as well as shoulder the responsibility for the diagnosis, the expeditious investigation when required, and the treatment of patients who voluntarily present themselves to their doors?

It is time for reflection and return to some basic truths.

The matter of the *National Health Service* has long been a convenient political platform and emotive cry for politicians to use to seek election or re-election. Economic analysis is poorly understood. Indeed Nye Bevan, at the introduction of the NHS is England, rationalized the costs to Parliament by implying that once tuberculosis was treated and hernias repaired, then costs would fall and economic benefits increased as more workers return to the work force.[3] Clearly this is not so.

Expectations of health care delivery have risen in the same way as expectations of life and living have risen. However, access to the health care system has remained open. There is an open-ended commitment to care for all individuals in society, no matter who, or what caused their problem, or from where they came. This attitude is traditional and, based on the fact

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that illness was considered to be an act of God, an event beyond control or manipulation by the individual. Certainly until the advent of sanitary engineering and antibiotics, there was little that could be done to alter the natural course of most infections.

Now we are a more sophisticated society with respect to understanding the etiology of our diseases. We smoke, we eat too much, we drink, drive and maim others or ourselves when we crash; we are free to pursue our sexual inclinations without fear of compulsory testing or treatment, or protection of our partners or potential healers, from a disease that so far carries 100 percent fatality rate.

We are free to consult our doctors as often as we feel necessary, whenever we want, and request multiple opinions from specialists. We are free to embark upon courses of treatment that may cause complications and require further care within the health care system, yet cannot be construed as emergency or urgent, e.g. gastroplasty, limb lengthening, infertility treatments, etc. Furthermore, we have found the medical profession willing to accede to most of our demands as individual patients.

Can society afford this luxury of the relationship of a patient and their doctor? Is society prepared to change its way of thinking, and are the organs of society prepared to change? These questions are not going to be easy for any group within society.

Patients may have to practise self restraint in their use of the health care system and pay a price for indulging in some traditional vices. There will have to be some non-too subtle aids to encourage them to move in that direction, such as monthly premiums for health care insurance, charges for nonemergency use of emergency rooms, premium loadings for smoking and obesity, and premium reductions for wellness, e.g. documented fitness programs, etc.

Doctors may have to accept the inevitable and realize that the way the health care system is organized at the present time means that they are the 'gate' to that system. They must therefore act responsibly in spending health care dollars. They will need those necessary safeguards to prevent the over investigation that present malpractice premiums encourage (our premiums may be one-tenth of those in the U.S.A., but the awards are not, and the fees for the operative procedures are often less than one-tenth of those in the U.S.A.).

In addition, doctors must be prepared to impose and be imposed upon by much more stringent auditing, both to prevent the few that abuse the provincial health care plans and also to identify and educate physicians whose standard of practice are unacceptable, before the legal profession proceeds at great expense and public vilification to obtain compensation for the patient. Our house should be seen to be in order before politicians impose their ideas on our profession.

Politicians must divorce themselves from the health care system nationally and provincially. The present patronage style of political expediency in Canada, where decisions are taken with one eye on the facts as prepared by the Civil Service and one eye on the political kudos to be gained, plays havoc with long-term health care planning.

The health care system should be made semi-autonomous by setting up an independent health care commission, with elected representatives from Parliament and representatives of the health care professions. The objectives of such a commission would be to indulge in long-term planning of health care within Canada, the education of the public, the regulation of medical development and research, and quality control audits throughout the Country.

The ever escalating costs of the health care systems are common to all Western societies, and are not going to be alleviated by short term solutions.

It is time for the Canadian people, the Canadian medical profession, and the Canadian politicians to realize that they all have a role to play and they should all be prepared to shoulder the responsibility for preserving the health care of the future and present generations. We should prevent the medical profession from being made a convenient scape-goat for the inadequacies of the present system and seek to educate all within our society of their individual and collective responsibilities. We must look to leadership within the medical profession!

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In deciding whether a new theory might be true, the question is not whether it is crazy — but whether it is crazy enough.

Niels Bohr (1885-1962)

Child and Adolescent Mental Health Services in Rural Nova Scotia

IMPORTANT ELEMENTS OF THE SERVICE STRUCTURE*

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The mental health problems and needs of children and adolescents are receiving increased attention across the province. The difficulties in providing health services in areas where there is low population density are well known. Despite these universal problems encountered in planning a system of service delivery in rural areas, this paper proposes that mental health services to children and adolescents can be strengthened when local service units are designed that avoid competition with adult mental health centres, are actively coordinated with the specialized resources of urban facilities, and have an ongoing clinical evaluation component.

One view that appears to be widely held in western society is that rural life is "superior". The ideology of rural superiority seems to have originated from an "antiurban view" that has permeated politics, literature, and science for well over a century. Thomas Jefferson captured this antiurbanism when he likened New York City and London to a sewer of "all the depravities of nature". Benjamin Rush, a leading physician of the colonial era, characterized cities as "pestilential to the morals, the health, and the liberties of man". Today, programs regularly come across our television screens portraying the hassled urban executive escaping to the simpler, healthier life of the countryside. The city has consistently been contrasted to the country in this invidious manner. In rural areas, relationships are seen as more "genuine" and "real" — based on informality, face-to-face contact, and a concern for the total person. The pace of life is said to be slower and there is perceived to be less stress. In contrast, cities with the crowding, noise, environmental decay and associated stress have been characterized by formal, segmented, and impersonal relationships.[1]

Recently, several investigators have hypothesized that an unintended consequence of this antiurbanism has been a systematic neglect of the social problems of rural areas.[1 2] The tendency to romanticize and glorify rural life has obscured or minimized the extent of the disorder in these areas. While the factors that create stress may be different in rural areas, there is stress nonetheless.

This fact is supported by recent studies suggesting that the incidence of psychiatric and behavioural disorders in rural areas is significant and may be as high as in urban areas.[1 2 3] However, rural areas often lack a cohesive service delivery plan to meet these health needs. Unintended neglect, the frequent lack of monetary resources, low population density, and the lack of practical, public transportation systems for rural areas, are often cited as reasons for the lack of a well defined and coordinated service delivery plan.[2 4 5]

While these observations have been made in the broad consideration of community mental health, they appear to be equally valid for the more restricted subset of problems that might be termed child and adolescent mental health issues. Consideration of child and adolescent psychiatric and behavioural issues has historically lagged behind consideration of adult issues. Thus, it is of little surprise that concrete planning and design of service delivery systems to meet the specialized mental health needs of this age group has typically lagged behind the design of services for adults.

In the years 1979 to 1983, a province-wide study of psychiatric mental health services for children and adolescents was conducted under the auspices of the Nova Scotia Department of Health.[6] Among its many conclusions, the study noted that in rural regions of the province, mental health services of children aged 0-19 were typically provided in the context of adult mental health services. Without a clear separation of services, youth services often lost the resulting competition in terms of range of services offered, and competition for staff time and appointments.

An unfortunate consequence of this competition has been a chronic shortage in rural areas of staff with

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*This paper is based in part on a presentation by W. Crist and L. Blood at the 22nd Annual Conference of the Association for the Care of Children's Health, Halifax, May, 1987.

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the training and expertise necessary to deal with child and adolescent issues. As the report noted, "most of Nova Scotia's child and adolescent mental health experts and facilities are located in Metro".[6]

While the logic of locating specialized facilities in Halifax-Dartmouth is undeniable, the relative lack of services in rural areas coupled with the absence of any mechanism to *actively* coordinate services in Halifax with the local mental health system often results in poor utilization of the health care system.

In this paper, a model is presented for the development of a coordinated system for the delivery of mental health services for children and adolescents in rural areas. The model essentially summarizes the development of such a service in the Cape Breton region of the province and includes three key components: the development of a local mental health service for children and adolescents separate in name and identity from the adult mental health facility; an active consultation link with the Izaak Walton Killam Hospital for Children in Halifax; and an ongoing clinical evaluation component.

DEVELOPMENT OF LOCAL SERVICES

Prior to 1983, only a single mental health centre in Cape Breton existed to serve the needs of children and adults alike. The majority of staff at the centre felt uncomfortable dealing with childhood and parenting issues and thus, services to children and adolescents were generally limited to brief initial assessments with little treatment or follow-up provided. There was limited contact between the mental health centre with other agencies in the community serving children and adolescents (e.g., with the Children's Aid Society, Family Services of Eastern Nova Scotia). And, perhaps as a result of this situation, a reasonably high percentage of Cape Breton residents were seeking or being referred directly by their physician to outpatient services in the Halifax area. According to Department of Health statistics, 14% of all psychiatric outpatient registrations in 1982 for Cape Breton children aged 0-19, were registered at Halifax facilities.

In 1983, an internal administrative reorganization of the Cape Breton Mental Health Care created a separate Child and Adolescent Service. The service was located in a different wing of the hospital from adult services and had a separate entrance. Initially, the service was staffed by the two members at the mental health centre who had the most interest and experience in dealing with children and adolescents. While this initial step was a token effort at first — the two staff were able to see less than 50% of the referrals with the remainder being handled by staff assigned to adult services — it was an important step psychologically for the facility and helped to delineate the needs in this area of service.

Since that first year as new staff positions and vacancies have been filled at the centre, it has been possible to recruit new staff who have had prior experience and training in the area of child and adolescent mental health. The current staff complement for the Child and Adolescent Service is: 2 psychologists (Ph.D. level), 1 child psychiatrist, 1 social worker, 2 community mental health nurses, and 1 receptionist/secretary. As new staff were added to the Child and Adolescent Service, the number of children being seen by staff assigned to adult services decreased, finally reaching the point where virtually all children and adolescents are now seen by the staff of the Child and Adolescent Unit.

Importantly, the evolution of services in the child and adolescent area at the mental health centre has served as a catalyst for increased cooperation and coordination among the different local agencies serving Cape Breton children. Thus, the staff of the Child and Adolescent Unit serve as formal consultants to a number of local agencies and programs including the four local offices of the Family Service Agency of Eastern Nova Scotia, the Children's Aid Society, and a local group home for juvenile offenders.

CONSULTATION LINK WITH I.W.K. HOSPITAL

By itself, the development of a local child and adolescent mental health service in a rural area does not guarantee the efficient delivery of services. A local service cannot hope to replicate the specialized diagnostic services — both medical and psychological — that are available in a larger facilities. The need for hospitalization and intensive treatment for certain types of problems will always exist. Thus, one role of the local service is to provide initial screening for cases, deciding which problems can be treated satisfactorily on the local level and which cases need more specialized/intensive assessment and treatment.

Often in rural service development, there is little thought given to the management of this necessary and important relationship between local service and urban facility. For an effective screening process to take place — and thus, efficient decisions on which health resources for assessment and treatment should be utilized for a given case — there must be an indepth knowledge by the urban facility of what resources are available on the local level, and there must be a corresponding knowledge by the rural facility when to refer for more specialized/intensive assessment and treatment. Without aggressive consideration of how to manage this relationship between rural and urban facility, the relationship often becomes one of sporadic case by case contact that typically does not develop the reciprocal knowledge of rural and urban service capabilities.

Early in the development of the Cape Breton Child

and Adolescent Service, a formal consultation agreement with the Out-Patient Psychiatry Department of the I.W.K. Hospital was arranged. The core of the agreement provided a monthly consultation day in Cape Breton by I.W.K. staff, in which the consultant was paid on a sessional basis plus travel and accommodation expenses. The arrangement was designed to be one of consultation to the local agency, not one of performing service locally. Thus, the principles guiding the development of the consultation link were:

1. Any new case seen in consultation must be initially assessed by a staff member of the Cape Breton Child and Adolescent Service.

2. The Cape Breton staff member must be present for the consultation session so that it is clear to the family that this is consultation and that the case is not being taken over by I.W.K. staff. Having the Cape Breton staff member present is also essential to the process of gaining reciprocal knowledge about local and urban resources and capabilities.

3. Consultation may be repeated on a particular case at the request of the Cape Breton Unit.

4. The Cape Breton Unit determines its own internal priorities for use of the consultant's time. Thus on occasion, the consultant's time has been used to provide inservice lectures on specialized topics or to discuss more general aspects of local program development.

5. A clear path of communication was established between the Unit Administrator of the Cape Breton Service and the I.W.K. Consultant, so that all communication between the two services went through them. This is especially important to avoid referrals that attempt to "go around the system". Referrals that are made directly to the I.W.K. Out-patient Psychiatry Department from Cape Breton are not accepted unless they have been previously seen at the local unit.

6. There is ongoing development of the consultation link to increase its effectiveness. Thus, over the last several years the local unit has developed the capability of videotaping sessions that could be reviewed quickly for consultation purposes or even sent to Halifax for between visit review if necessary. The development of a lunch time team meeting also provided the mechanism for reviewing the status of cases previously seen in consultation.

Since the consultation link was established in 1983, there has been a steady, significant decline in the number of Cape Breton residents aged 0-19 registered as psychiatric outpatients by Halifax facilities. Absolute numbers have fallen from a high of 52 cases in 1983 (representing 15% of all psychiatric out-patient registrations of Cape Breton residents aged 0-19) to just 15 (or 4% of all psychiatric out-patient registrations) in 1985. Since 1985 the rate has remained around 4%. While admittedly one must be careful of correlational data, we propose that one possible explanation for this drop in number is that the consultational link has led to an effective screening of cases and thus, better utilization of health resources.

Beginning in 1985, an additional consultation link was established with the Psychology Department of the I.W.K. Hospital. Consultation has involved the more specialized issues of neuropsychology, developmental assessment, and behaviour therapy. On several occasions, on-site consultation in Cape Breton has meant that a family did not have to travel to the Halifax area for specialized assessment.

CLINICAL EVALUATION: SURVIVING IN THE RURAL ENVIRONMENT

The necessity of evaluating new programs is a doctrine which is now strongly entrenched in both the clinical and bureaucratic worlds. For many programs, the underlying utility of an evaluation component is to justify the program's existence or to make arguments for program expansion. Currently, when the health budget is coming under increased scrutiny, it seems prudent that any clinical program develop a strong program of self-evaluation.

In this regard there seems to be a tendency to equate program evaluation with caseload statistics — the number of referrals, number of appointments, or average length of therapist's time per contact. While interesting, these numbers provide little information on the nature of the clinical problems being seen or on the effectiveness of the clinical intervention. The Cape Breton Child and Adolescent Service, as part of the initial case assessment, collects basic demographic data on each client and family through a family questionnaire as well as standardized information on the child's behaviour by using the Child Behaviour Checklist.[7] Although certainly not the only instrument available, the Child Behaviour Checklist is one that has been recommended as being appropriate for both general population studies as well as clinical evaluation studies using pre-, post-designs.[8 9] The data are stored routinely on a small personal computer for easy access and analysis. The staff of the Cape Breton Child and Adolescent Service have used these data to compare their referral population with other mental health centres, to evaluate various clinical parameters of the referral population (e.g., behavioural profiles of children from single mothers), and in follow-up of individual cases.

This process of active self-evaluation may well fulfill another function critical to the development of rural services. Turner, writing in a handbook for rural mental health workers on personal and program survival, suggests that the evaluation process can help overcome the sense of isolation and burn-out that makes it difficult to recruit and retain personnel in

rural areas:

> "In recent years we have moved from a position that saw the roles of practitioner and scientist as a dichotomy to one in which they are rapidly becoming a unity. I am firmly convinced that this is an essential shift that all of us in rural practice must make for our professional development. . . . The new role of scientific clinician can do much to enhance our sense of autonomy because it puts us directly in touch with that critical question "how am I doing?" that so often haunts us in a vague, diffuse way, especially when much of our practice takes place far from large centres and the reinforcement of our colleagues".[10]

By building in a strong *clinical* evaluation component to our rural services we can improve the effectiveness and specificity of the clinical efforts, maintain the professional growth and motivation of staff, and along the way, hopefully, learn more about the rural environment and its impact on mental health. □

Dr. Ivan Carter died suddenly and unexpectedly on February 28, 1988. A full Appreciation appears on page 69 of this *Journal*.

In August, 1983 Dr. Ivan Carter began consultation to a newly created out-patient mental health service for the children and adolescents of Cape Breton. As the Unit's first Administrator, I had the pleasure of working closely with Ivan to develop the service and the model of consultation delivery. His commitment to the development of strong local services, coupled with his extraordinary ability to teach his field, strengthened the clinical skills of all the staff in the unit. The personal friendship that developed between us during the monthly after-hours squash games undoubtedly contributed to the special relationship that developed between the local service and the tertiary care centre for children — the I.W.K. Hospital.

However, Ivan stressed the fundamental importance of formalizing the consultation process between local services and the tertiary centres, rather than relying solely on personal relationships or sporadic case by case contact between facilities. The need to carefully consider the relationship between local and tertiary services so as to strengthen and coordinate mental health services within the broader health care system is one of the central points presented in this paper. His voice speaking out on issues of program development, his clinical skills, and his friendship will be greatly missed.

W.B.C.

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Drug Testing in the Workplace

A Report Adopted as an Information Paper for Use by Nova Scotia Physicians in Their Practice*

Prepared and presented by
The Occupational Health Committee of
The Medical Society of Nova Scotia
September 1987

The Occupational Health Committee contended that drug testing in the workplace is evolving irrespective of whether or not the medical profession agrees with the concept. As a consequence the Committee prepared and gained approval of guidelines for Society members on the subject which includes pre-employment testing, regular testing and random testing. The guidelines set out the various considerations physicians will have to take into account when dealing with this matter.

J.D. Prentice, Chairman
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Drug testing in the workplace, involving preemployment testing of prospective employees or periodic or random testing of current employees, has become a widespread activity in the United States and has subsequently been introduced in selected industries in Canada. Currently, it is estimated that 30% of *Fortune 500* companies in the United States have instituted some type of drug screening program.[1] At the same time, there has emerged a growing debate regarding the use of drug testing as a method of controlling drug abuse in the workplace or in society in general.

This report neither supports nor refutes drug testing in the workplace. Rather, it seeks to identify the limitations of such programs and to discuss issues related to drug testing programs that must be considered when planning or initiating these programs in the workplace.

LIMITATIONS

Central to the debate over workplace drug testing are questions which cannot be answered readily from existing U.S. or Canadian data. Firstly, there is the question of the magnitude and significance of drug abuse in the workplace. Secondly, there are technical issues related to the interpretation of screening and confirmatory laboratory procedures.

1. Magnitude and Significance

In the United States, there is a general concern that the problem of drug abuse is growing and that the types of products abused have led to a greater potential problem in the workplace. For example, changes in usage patterns to "middle class" drugs such as cocaine would increase the likelihood of the presence of such a drug in the workplace. There is little firm evidence however to support these suppositions.

Similarily in Canada, there is lack of comprehensive data to identify the presence or absence of a drug problem in the workplace. Population surveys commissioned by the Health Promotion Directorate of Health and Welfare Canada in 1984, 1985 and 1986 have examined alcohol, tobacco and marijuana usage in the adult population aged 18-29 years.[2] These polls do not indicate any increase in the products questioned over the time interval defined. As well, since 1969, the Nova Scotia Commission on Drug Dependency has undertaken cross sectional surveys at three year intervals of junior and senior high school students in select areas of Nova Scotia examining alcohol, tobacco, marijuana and other drug usage.[3] No increase in prevalance trends for the types of products used have been identified over the last three survey dates, although the amount or volume of selection products used (example alcohol) has increased.

Related to the magnitude of the problem is the question of the effectiveness of workplace drug screening in either preventing or reducing drug usage among the workplace population. There is little specific information to demonstrate that screening acts as a deterrent to existing drug usage or to initiating new usage. While there has been some recent suggestion from the United States that drug testing may play a beneficial role in this regard, these occurences are limited to situations involving comprehensive approaches to drug abuse, prevention, treatment and control.

2. Screening and Laboratory Issues

Screening and confirmatory drug testing of high sensitivity and specificity are available, but their costs

*Adopted as an information paper by the Executive Committee of The Medical Society of Nova Scotia, September 19, 1987.

are considerable. Low cost screening tests are available but are associated with both false positive and false negative results. Test interference with prescription products to produce false positive results and the timing of testing relative to exposure must be fully appreciated for both the drugs being examined and the analytic procedures employed.

Finally, it must be recognized that drug testing is qualitative and semi-qualtitative at best — cutoff points for drugs distinguish exposure only and not a level of impairment likely to affect performance. The latter qualitative measure exists only for alcohol in the context of drinking and driving.

OBJECTIVES OF DRUG TESTING PROGRAMS IN THE WORKPLACE

Drug testing programs in the workplace exist for three general reasons:

1. Testing to determine non-compliance among known abusers who have completed drug abuse programs.
2. Testing indicated to protect the public health, the health of other workers, or the safety of the individual employee.
3. Testing viewed by the company as being economically advantageous.

Drug testing to determine compliance with treatment regimens has been undertaken in both the workplace and the general population. The effectiveness of drug testing in ensuring long term compliance has not been demonstrated. Its use is limited to known substance abusers who have completed treatment programs. In the workplace, it is presumed that such testing would be undertaken in conjunction with comprehensive employee assistance programs.

An area of increasing interest is the application of drug testing to individuals who are employed in situations which potentially effect public health. For example, if a suspect or demonstrated alcohol abuse problem existed among airline pilots, preflight breathalizer testing might be implemented. Testing would be limited to situations in which a potential problem was identified and where the drug abuse might affect or influence the public health. Similarly it could be argued that by identifying situations where the safety of the individual or other employees is threatened, drug testing would be warranted as a part of a comprehensive approach to the problem.

The economic rationale for drug testing programs implies that the costs of such programs are offset by reductions in absenteeism, injuries, inefficiencies and added security to company operations. Adequate demonstration of the cost effectiveness of this approach does not exist. Economic incentive constitutes however the most common reason for introducing drug testing programs.

ROLE OF THE PHYSICIAN REGARDING DRUG TESTING IN THE WORKPLACE

As previously noted, the decision to institute drug testing in the workplace is a corporate decision that is frequently taken or considered for reasons other than the health or safety of employees. Medical input should be provided at the preliminary phase of drug testing programs to assist in identifying the nature and magnitude of the problem, to clarify the intended goals and objectives of a drug testing program and to balance program costs and limitations against anticipated gains. Alternatives available to confront the specific problem such as employee assistance programs should be fully explored.

If a company institutes preemployment, regular or random drug testing, physicians should play a central role in such programs to ensure that they are conducted in the best interests of employees. Relevant principles that must be considered in the workplace drug testing programs include:

1. Written consent for screening and for communicating results to the employer should be obtained from employees prior to testing.
2. Confidentiality in terms of restricted access of results to health care personnel is imperative.
3. A physician should evaluate positive results prior to a report being made to the employer.
4. Positive results should be discussed between the employee and the physician prior to a report to the employer.
5. Reports to employers should take the form of the physician's impression as to the employee's suitability to meet the requirements of the job function. The job function should be fully specified by the employer. Reporting of specific results or values should be avoided.
6. Analytic techniques for screening and confirmation should be both sensitive and specific. The physician should be aware of the limitations of the analytic technique, potential interferences and the necessary time frames for positive results (see the American Medical Association document entitled *Scientific Issues in Drug Testing* for a discussion regarding technical aspects).[4]
7. The process of collection, transport and analysis and reporting of results should be under the supervision of a physician.

Continued on page 52.

Illicit and Licit Drug Use Among Adolescents in Nova Scotia

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Periodic surveys of drug use behaviors of adolescents have been done in Nova Scotia since 1969.[1-3] The results of these surveys have assisted governmental agencies, school systems and health organizations in monitoring trends and developing appropriate policies and intervention strategies. While alcohol, tobacco and cannabis remain the most commonly used drugs among secondary school students, a wide range of other illicit and licit drugs are avilable to and used by a sizeable minority of students as well.[4]

The purpose of this paper is to present the results of a survey on the prevalence of the use of these "other" drugs among students residing in an urban and rural region of Nova Scotia.

METHODS

Sample

The sample consisted of students in Grade 7 through Grade 12 (ages 13 to 19) residing in an urban (Halifax) or rural (Pictou County) area of Nova Scotia. A systematic sampling procedure was utilized involving a random start, followed by the selection of every fifth class on the master list obtained from the respective school boards. Because of the constant selection ratio, the sample is self-weighting.

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

Questionnaire

The survey questionnaire was based on one originally developed by Smart and Jackson[5] and modified by Mitic and Neumann.[3] In order to make the Nova Scotia survey comparable to those done in other jurisdictions, Smart's 1985 guidelines for Canadian school surveys were closely followed.[6]

A major part of the survey consisted of questions that queried students on the frequency of esoteric drug use in the past 12 months. These drugs included the hallucinogens, phencyclidine (PCP), inhalants, cocaine, opiates and stimulants, tranquilizers, and barbiturates (with and without a physician's prescription). Other questions, the results of which will not be presented here, asked students about the use of tobacco products, alcohol and cannabis.

The validity of response to the questionnaire items was enhanced by including a question on the use of a fictitious drug. If a student indicated using this fictitious drug in the past 12 months, the response sheet was subsequently discarded. Response sheets completed by students who indicated that they had not used the fictitious drug or who did not know what the drug was were included in the survey results.

All available evidence suggests that anonymous self-reported drug using behaviours have a high degree of reliability[7,8] and validity,[9] and that the most common source of invalidity is under-reporting rather than over-reporting. Therefore, results from surveys of this type may indicate an underestimation of actual use.

RESULTS

A total of 2200 students were surveyed. Eighty-six (3.8%) of the responses were incomplete or contained invalid information, as specified above, and were subsequently discarded. The sample therefore consisted of 2114 students, of whom 1122 resided in Halifax and 992 were from Pictou County. The Halifax City sample consisted of 578 (51.5%) males and 544 (48.5%) females, while the Pictou County sample was composed of 462 (46.8%) males and 525 (53.2%) females.

Table I displays the percentage of males and females residing in urban and rural areas of Nova Scotia who responded positively to each drug category. The most commonly used drugs (8% or greater by any one group) are the hallucinogens, inhalants and stimulants (with and without a physician's prescription). Relatively few students reported using cocaine or tranquilizers and only a small minority responded positively to using barbiturates, phencyclidine or opiates.

A significantly greater number of males (χ^2=26.86, 1 df. p=.001) and females (χ^2=5.3, 1 df. p=02) residing in Pictou County as compared to Halifax reported using inhalants in the past 12 months. Figure 1 presents a more detailed examination of inhalant use

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by grade between the two regions. Among male users of inhalants, those residing in the rural area outnumbered their urban peers in grades 7 (x^2=4.26, 1 df. p=.04), 8 (x^2=5.74, 1 df. p=.01) and 9 (x^2=5.9, 1 df. p=.02). Among female inhalant users, significant difference occurs only between grade 7 students (x^2=8.6, 1 df. p=.003).

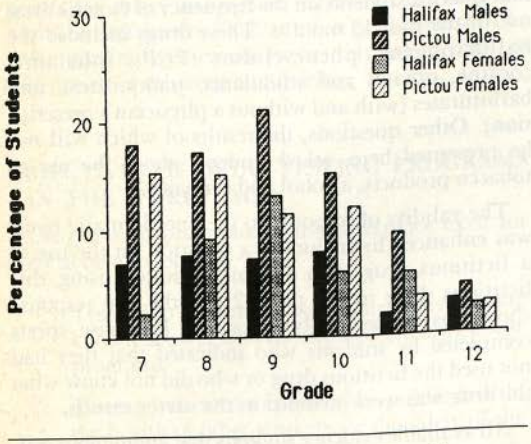

Fig. 1. Inhalant Use by Grade, Sex and Location

Hallucinogenic use is more common among rural males (x^2=8.2, 1 df. p=.004) and urban females (6.26, 1 df. p=.01) as compared with their respective counterparts (Table I). Figure 2 displays the percentage of students from each grade, by gender, who reported using an hallucinogenic drug at least once in the past year. Rural males in grades 7 (x^2=4.28, 1 df. p=.03) and 11 (x^2=4.11, 1 df. p=.04) more often report using hallucinogenic drugs than urban males, while among females the opposite is true. In this case, significantly greater numbers of urban females (x^2=7.31, 1 df. p=.006) used hallucinogens as compared to rural females.

While no significant differences in prescription stimulant use by either gender occurred between regions (p > .05), significantly greater numbers of males residing in Pictou County reported use of non-prescription stimulants as compared to those from Halifax (x^2=4.94, 1 df. p=.02). Figures 3 and 4 present the percent of students by location who reported prescription and non-prescription stimulant use respectively. Significant differences occurred only between grade 11 males reporting non-prescription stimulant use (x^2=7.29, 1 df. p=.006) with more rural than urban students reporting use.

Weight loss was the reason stated by 32.2% and 30.0% of females from Halifax and Pictou County respectively as the reason for using stimulants, while 12.1% and 13.6% of males reported this as their reason for using drugs in this category.

TABLE I

DRUG USE BY SEX AND LOCATION
(Past 12 Months)

	Males		Females	
	Halifax %	Pictou Co. %	Halifax %	Pictou Co. %
Hallucinogens	6.9	12.3	8.8	4.8
Phencyclidine	1.9	2.4	1.4	1.7
Inhalants	5.8	15.8	6.5	10.6
Cocaine	4.1	2.8	2.3	2.3
Opiates	1.9	2.6	1.4	4.0
Stimulants				
with Rx	6.3	6.3	8.1	8.3
without Rx	6.3	10.3	10.5	10.0
Tranquilizers				
with Rx	4.3	4.3	4.9	4.3
without Rx	2.9	3.4	3.6	5.1
Barbiturates				
with Rx	1.0	1.3	0.5	1.5
without Rx	0.7	0.9	0.9	2.1
n	578	544	462	530

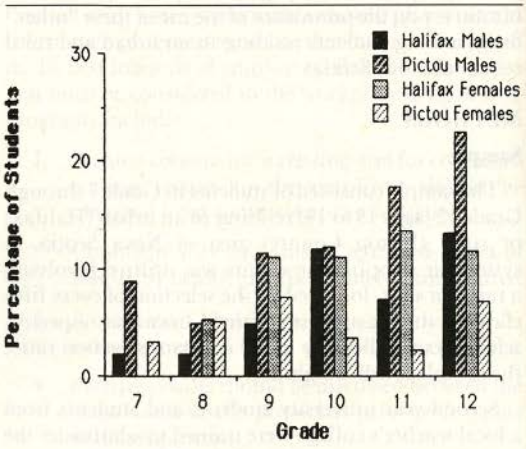

Fig. 2. Hallucinogenic Use by Grade, Sex and Location

DISCUSSION

Caution is advised in the interpretation of these results. The teenagers surveyed were all in school. No attempt was made to survey students not present at school on the day the survey was conducted, or who had dropped out of the school system. A non-school population in this age category may plausibly have produced different results.

Also, while precautions were taken by including a lie-question to detect those students who might over-estimate their drug use, the survey was self-reporting in nature and therefore, the possibility exists that some students under-estimated their drug use or were cognizant of the lie question's purpose. Nevertheless, the results of this study are consistent with findings reported in other parts of Canada that have been similarily surveyed.[10–12]

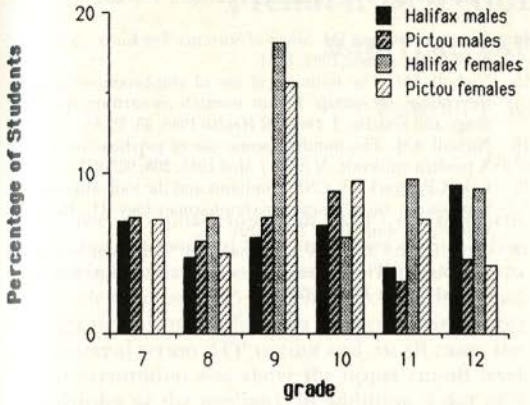

Fig. 3. Prescription Stimulant Use by Grade, Sex and Location

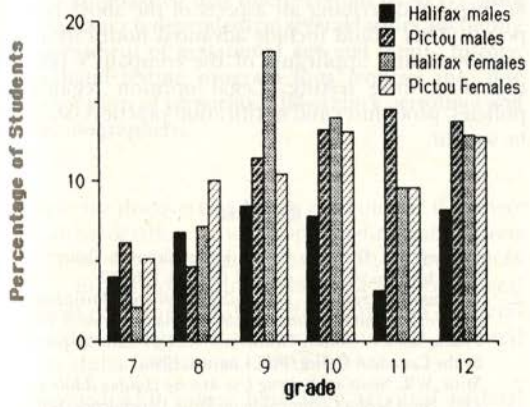

Fig. 4. Non-Prescription Stimulant Use by Grade, Sex and Location

Three categories of drugs, the inhalants, stimulants and hallucinogens, were used at least once in the past year by a sizeable minority of students surveyed. Much of this was infrequent and experimental use rather than being habitual or addictive in nature. This study's findings give some indication of the accessibility students have to these drugs. It also reveals that rural areas of Nova Scotia apparently provide little insulation against what once were considered to be behaviours more typical of the urban adolescent.

The most popular inhalants or volatile solvents are glue, nail polish remover, paint thinners and a variety of aerosol substances, the effects of which are feelings of euphoria and exhileration.[13] The characteristics of heavy use are similar to those experienced with alcohol intoxication: slurred speech, disorientation and unsteady gait. Because solvents are readily available and offer the user a relatively cheap "high", they are often associated with economic impoverishment.[13]

Various legal, community development and social based educational programs have been tried in attempts to prevent use of these drugs. Because this intervention often operates in isolation, such as in the form of a one-time school program, and because the programs frequently lack a suitable evaluation component, these attempts have achieved only limited success.[13] School programs, if they do exist, often focus on the more popular drugs such as alcohol, tobacco and cannabis while legal controls are of questionable value since the substances are readily available.

Because of the potentially serious, even life-threatening consequences of inhalant use, a multi-faceted prevention approach is necessary.[4] When approximately one in five urban junior high boys report using an inhalant in the past year for the purposes of "getting high," this issue deserves the attention of both school and community groups. Specific reference to inhalants should be included as part of the comprehensive drug education program offered to all students. As well, the co-operation of local merchants in restricting the sale of volatile substances to young adolescents and the placement of these substance behind the counter deserves further consideration. There is such a wide range of volatile substances in use for such a wide variety of purposes that complete control of supply is obviously impossible. Nevertheless, aiming to reduce inhalant use in rural areas to that found in urban areas is a reasonable preventive objective.[4]

The second drug class in fairly common use are the stimulants, with a physician's prescription (diet pills, pep pills) and without a prescription (speed, diet pills, pep pills, uppers, Black Beauties, Christmas Trees, benzedrine, Dexedrine®). Because of the increased availability during the past few years of the over-counter stimulants and mail-order pseudo-amphetamines that look like amphetamines ("look-alikes"), some authorities believe there has been an increase in the use of these drugs.[15] These readily available pills contain caffeine combined with the mild stimulant phenylpropanolamine.[16] Clinically, amphetamine is prescribed for narcolepsy, attention deficit disorder in children, and severe endogerous obesity.[17]

Stimulants produce a state of exhilaration, a surge of energy, a state of extended wakefulness and a loss of appetite. Little wonder, with these pharmacological qualities, that these drugs are attractive to the adolescent population. In a society where the slim figure is idolized, especially among women, and extra energy is readily available in pill form, a sizeable minority of adolescents find these drugs irresistible.[18]

The third class of drugs with elevated rates of use, as determined by this study, is the hallucinogens (LSD, MDA, STP, peyote, magic mushrooms and mescaline). Proponents of hallucinogenic drugs argue that use

expands the mind, enhances sensuality, improves perceptions and contributes to a better life.[13] Most adults view its use among this adolescent subculture as an unacceptable and even dangerous escape from reality.

CONCLUSION

Rural areas, once thought to be havens, insulated from the range of drug behaviours associated with urban life, are no longer immune from these practices. The prevalence of drug use in rural regions of Nova Scotia in some cases now exceeds that reported by their urban counterpart. These findings provide additional evidence of the need for education, prevention and intervention strategies and emphasize the need for the co-ordinated efforts of parents, schools and community organizations in addressing this issue.

□

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DRUG TESTING IN THE WORKPLACE

Continued from page 48.

Written company policies and procedures should be in place describing all aspects of the above noted points. This would include advanced notification to employees and applicants of the company's policy regarding drug testing. Legal opinion regarding policies, procedures and notification practices, should be sought.

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Use of Alpha-Fetoprotein Measurement in the Prenatal Detection of Fetal Anomalies

MARITIME EXPERIENCE 1982-1986

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The use of alpha-fetoprotein (AFP) measurement in prenatal diagnosis of fetal anomalies during a five year period was reviewed. Amniotic fluid AFP was grossly elevated in all 15 cases in which the fetus had an open neural tube defect. Six of these patients also had maternal serum AFP testing and, in all cases, the AFP concentration was above the upper cut-off level (2 multiples of the median). In addition, 4 out of 5 cases with abdominal wall defects had an elevated amniotic fluid AFP concentration. In a total of 1028 pregnancies tested during this period, there was only one true false positive.

It is emphasized that interpretation of AFP testing in pregnancy is dependent on several factors, including an assessment of gestational age and family history. A prenatal testing program thus requires the close collaboration of physicians, laboratory personnel and ultrasonographers.

Since the discovery by Brock and Sutcliffe that there was an association between open neural tube defects (NTD) of the fetus and increased alpha-fetoprotein (AFP) in amniotic fluid,[1] there have been several extensive studies of prenatal detection of fetal anomalies using both amniotic fluid and maternal serum alpha-fetoprotein (MSAFP).[2 3 4]

Elevated AFP values have been reported in fetal death, open neural tube defects, abdominal wall defects such as omphalocele and gastroschisis, and other anomalies. More recently an association has been reported between low levels of AFP and chromosomal anomalies such as Down Syndrome.[5 6 7]

One of the major difficulties in this type of testing is that there is an overlap between normal and abnormal ranges. There is a risk of false positive results if the amniotic fluid is contaminated with even a small amount of fetal blood, because the concentration of AFP in fetal blood is 100 to 200 times that in amniotic fluid.[8] The number of false positive amniotic fluid AFP results can be reduced substantially if its use is combined with ultrasonography and acetylcholinesterase (AChE) testing of the amniotic fluid. A second major factor is that the levels of amniotic fluid AFP in normal pregnancies change with gestational age, hence in order to avoid misinterpretation it is necessary to have an accurate estimate of gestational age.

The concentration of MSAFP also changes with gestational age, and with maternal weight,[9 10] diabetes[11] and twins. Doran *et al.* estimated that 9% of initially elevated MSAFP values were in fact not elevated when gestational age was corrected by ultrasonography.[4]

The purpose of this article is to review five year's experience with AFP testing in prenatal diagnosis and to draw attention to some of the advantages, problems and pitfalls associated with this type of testing. Results of chromosomal testing are not included in this article and will be reported separately.

DESCRIPTION OF THE PRENATAL TESTING PROGRAM, 1982-1986

Amniotic fluid testing was carried out for three general reasons:

1. A history of fetal anomalies in a previous pregnancy;
2. Maternal age greater than or equal to 35 years; and
3. Investigation following detection or suspicion of a fetal abnormality during ultrasonographic examination

Approximately 75% of the amniotic fluid specimens were collected at the Grace Maternity Hospital in Halifax and the remaining 25% were sent to Halifax by courier from various parts of the Maritimes.

Beginning in 1983, amniotic fluid AFP determinations were performed under the supervision of Dr. Charman Cousins at the Dr. D.J. MacKenzie Laboratory of the Victoria General Hospital in Halifax, using the rocket electrophoresis technique.[12] Prior to that time amniotic fluid samples were sent to the Toronto General Hospital for analysis. The Toronto results are not included in the calculation of normal values, but were used for the calculation of the overall detection rate of abnormalities.

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Ultrasonographic examinations were carried out in various hospitals throughout the Maritimes with the majority performed at the Grace Maternity Hospital. Amniocentesis was performed under ultrasound guidance in all instances and additional detailed examinations were performed in circumstances where this was indicated.

During the entire period of this study, MSAFP analysis was performed under the supervision of Dr. Morris Givner and Mrs. Charlene MacKenzie at the Dr. D.J. MacKenzie Laboratory of the Victoria General Hospital in Halifax. Serum aliquots (50µl) were assayed in duplicate using Pharmacia AFP RIA 100 reagents (Uppsala, Sweden). Serum samples were obtained from nearly all patients who had amniocentesis. In addition, MSAFP testing was performed on patients who had a relative with a NTD or other condition associated with an elevated AFP but who chose not to have amniocentesis. MSAFP screening for low risk pregnancies was not available during this time.

Cut-off values used for clinical decision making were altered slightly during the study period, so that all values were recalculated retrospectively for the purpose of this review. For amniotic fluid AFP, the values were expressed as standard deviations of the mean (SD) and maternal serum AFP was expressed in multiples of the median (MOM). For amniotic fluid testing, further investigation was initiated if the value were greater than 2 SD above the mean. Greater than 2 MOM was used as the action limit for maternal serum testing. Serum AFP values were ignored if the amniotic fluid was also tested and found to be < 2 SD above the mean.

RESULTS

Amniotic fluid AFP

Data from 710 singleton pregnancies with normal outcomes were used to calculate means and standard deviations for 15-19 weeks. A log scale conversion was used to adjust for the distribution (Table I). There were 15 (2.1%) pregnancies with an AFP between 2 and 4 SD above the mean, and non greater than 4 SD.

TABLE I

AMNIOTIC FLUID AFP CONCENTRATION FOR NORMAL SINGLETON PREGNANCIES 1983-1986

weeks gestation	number of patients	mean mg/L	+ 2 SD	number of patients 2SD
15	72	16.9	29.4	0
16	354	15.8	27.3	8
17	213	14.8	25.6	6
18	58	12.4	21.6	1
19	13	9.8	17.4	0
Total	710			15(2.1%)

Amniotic fluid AFP was tested from a total of 21 patients with fetal abnormalities (Table II). There were no genuine false negatives among the anencephalics and spina bifidas. AFP was not detectable in a sample submitted from a patient with an anencephalic fetus. However, the specimen was also negative for other proteins and we concluded that the specimen was maternal urine. This case was included in Table II to emphasize one of the potential pitfalls of a testing program, but it was not classified as a false negative because the problem was recognized at the time of analysis.

TABLE II

AMNIOTIC FLUID AFP TESTING IN PREGNANCIES WITH FETAL ABNORMALITIES

	Tested 15-19 Weeks		Tested 20-21 Weeks		
	≤ 2 SD	> 2 SD	≤ 2 SD	> 2 SD	Total
Anencephaly	0	8	1**	2	11
Open Spina Bifida	0	3	0	2	5
Agdom. Wall Defect	1	3	0	1	5
Total	1	14	1	5	21

* SD estimated, inadequate normal values from our laboratory for calculation.

** Sample was probably urine.

One patient in which an omphalocele was detected by ultrasonography had a fluid AFP value < 2 SD above the mean. Autopsy confirmed the presence of an omphalocele containing all the liver and a small proportion of the intestine. Another patient in which the fetus had an omphalocele, had an amniotic fluid AFP between 3 and 4 SD above the mean. In 19 of the 21 patients, the abnormalities were detected by ultrasonography prior to the amniocentesis.

There was one false positive amniotic fluid AFP in this series. An elevated amniotic fluid AFP was the result of an undetected deceased co-twin and this case has previously been reported.[13]

In three cases, a spinal anomaly was initially suspected by ultrasonographic examination. Amniocenteses were performed and both the amnioticfluid AFP and the MSAFP concentrations were within normal limits. All three pregnancies continued to term and resulted in a healthy infants. In one of these patients, the initial appearance of a posterior lumbosacral mass was attributed to a loop of umbilical cord superimposed on the lumbar spine. Repeat ultrasonography indicated a normal fetal spine.

Maternal serum AFP

Normal values for MSAFP in singleton pregnancies were calculated from patients known to subsequently have had a normal pregnancy outcome (Table III).

MSAFP testing was performed on 10 patients whose fetuses had neural tube or abdominal wall defects, and

the values were grossly elevated in nine. One patient, whose fetus had an omphalocele, had both MSAFP and amniotic fluid AFP concentrations within normal limits (Table II).

In the five years, a total of 44 patients with a family history of NTD chose to have MSAFP testing and ultrasonography but not amniocentesis. None of these patients had a MSAFP > 2 MOM and no cases of open NTD were missed.

TABLE III

MATERNAL SERUM AFP CONCENTRATION FOR NORMAL SINGLETON PREGNANCIES, 1982-1986

completed weeks	number of patients	median *	2 MOM*	patients 2 MOM
15	126	30.5	61.0	8 (6%)
16	487	32.5	65.0	21 (4%)
17	301	37.2	74.4	7 (2%)
18	49	42.8	85.6	2 (4%)
Total	963			38 (4%)

* Values are expressed in µg/L. The AFP standard, expressed in KU/L, is calibrated against WHO reference preparation 72/225. 1.0 KU/L is approximately equal to 0.9 µg/L.

DISCUSSION

Usually, an accurate diagnosis can be achieved by integrating the information obtained from laboratory testing of maternal serum and amniotic fluid, ultrasonographic examination and family history. However, potential causes of false negative and false positive results must be considered carefully and close collaboration of a clinical team is essential.

We have previously reported a retrospective study of the use of ultrasonographic examination alone in the detection of neural tube defects.[14] Ignoring examinations prior to 16 weeks gestational age, in a total of 37 pregnancies with spina bifida or encephalocele, only 27 (73%) of the defects were identified on the initial examination. Lindfors recently reported prenatal detection of 6 cases of open spina bifida: the amniotic fluid AFP was elevated in all 6, but the defect was identified by sonography in only 3.[15]

Interpretation of both serum AFP and amniotic fluid AFP is difficult because there is an overlap between "normal" and "abnormal" results. Therefore in choosing a cut-off level, it must be recognized that there will be both false positive and false negative results. In our experience with 15 open neural defects, the amniotic AFP level was > 5 SD above the mean in all instances. However, in a much larger series reported by Brock, 3/74 (4%) of pregnancies with an open spina bifida had AFP values between 2 and 5 SD above the mean.[16] In our series, in one pregnancy with an omphalocele the AFP value was between 2 and 5 SD above the mean. On the other hand, approximately 2% of normal pregnancies had an amniotic fluid value in this range.

Our current policy is to review all amniotic fluid AFP results which are > 2 SD above the mean for that gestational age. Further evaluation, such as AChE testing of the amniotic fluid and repeat ultrasonographic examination, is arranged when appropriate. Contamination with fetal blood is a frequent cause of evaluation of AFP in amniotic fluid and therefore, it is important to determine whether fetal cells are present in the specimen at the time of amniocentesis. Maternal serum AFP testing prior to amniocentesis may also be helpful in evaluating the cause of AFP elevation.

Interpretation of MSAFP is more complicated than amniotic fluid AFP because there is a greater overlap between normal and abnormal values. It should be emphasized that during 1982-86, serum testing was not performed as a general screening procedure but only in high risk situations or in association with amniocentesis. When amniotic fluid AFP was also tested and found to be 2 SD above the mean, the serum result was ignored. When there was a family history of neural tube defect, MSAFP and ultrasonography were offered as an alternative to amniocentesis but patients were advised that if an abnormality were present, the chance of detection was estimated to be about 90% compared with 99% for amniotic fluid testing. In our small series of 44 patients who had maternal serum AFP testing but not amniocentesis, no open neural tube defects were missed using a cut-off of > 2 MOM.

In the latter part of the study period, MSAFP testing for estimation of risk of Down Syndrome, based on lower levels of AFP, was offered to a few patients who were age 33 or 34 and concerned about the risk of chromosome abnormalities. Amniocentesis was then offered if the serum value was low enough to make the risk of Down Syndrome equivalent to the risk at maternal age 35.[17] We do not yet have sufficient data to evaluate our own experience in this regard.

It should be noted that the AFP concentrations presented in Tables I and III are derived from 1982-86 data, and "normal" values must be monitored on an ongoing basis to take into account any technique changes or unexplained drift.

CONCLUSIONS

The program described here involves testing of pregnancies having an increased risk of abnormalities because of family history, maternal age or ultrasonographic findings. We have demonstrated that the combination of maternal serum and amniotic fluid AFP testing and ultrasonographic examination has resulted in an accurate diagnosis in nearly all instances. In the five year period, there were no false negative AFP results in the presence of an open neural tube defect and only one true false positive. Amniotic fluid AFP concentrations were > 5 SD in all 15 cases of open NTD.

Because most neural tube defects occur in families without a family history of similar problems, only a small proportion of anomalies will be detected if only those at high risk are tested. The introduction of a maternal serum AFP screening program available to all pregnant women in Canada has recently been advocated.[18] The Province of Manitoba currently provides province-wide screening and a program is under consideration in Ontario. The decision whether or not to introduce such a program in the Maritime Provinces is complex and we believe that careful attention must be given to the provision of adequate financial resources to provide the facilities, personnel and physician and patient education as outlined in the 1987 Policy Statement of the American Society of Human Genetics before such a program is introduced.[19]

□

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The Decreasing Incidence of Sudden Infant Death Syndrome in Nova Scotia 1977-1985

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Using the death certificate as a marker, coupled with the medical record and autopsy diagnoses, the incidence of Sudden Infant Death Syndrome (SIDS) in Nova Scotia was examined from 1977 to 1985. The number of live births in the province ranged from 12,178 to 12,596 during these years. The incidence of SIDS decreased markedly from 2.5/1,000 live births in 1977 to 1.5/1,000 live births in 1985. As well, significant differences were found in the incidences of total deaths, neonatal deaths, post-neonatal deaths and SIDS when the six-year period of 1977-82 was compared with the three-year period of 1983-95.

In 1970, Beckwith defined Sudden Infant Death Syndrome (SIDS) as "the sudden unexpected death of any infant or young child which is unexpected by history and in whom a thorough necropsy examination fails to demonstrate adequate cause of death".[1] SIDS, therefore, is a diagnosis by exclusion rather than a diagnosis by the presence of positive criteria.

The incidence of SIDS in England, Scotland, France, New Zealand, Australia and North America has ranged from 1.45 to 2.7 per 1000 live births during the last 10 years.[2-6] Death certificates have usually been used for case ascertainment and the reported incidence of SIDS has been related to the autopsy rate. In Scotland, for example, where autopsies were performed on nearly 100% of infants thought by death certificate to have died of SIDS, the diagnosis of an alternative cause of death was made in 16.5% of cases.[3]

Using death certificate and autopsy diagnoses we report that the incidence of SIDS in Nova Scotia has fallen dramatically.

METHOD

With the permission of the Minister of Health of Nova Scotia two of us (CSC and PRC) reviewed all death certificates of infants born in the Province from 1977 to 1985 who died before 365 days of age. Non-resident infants dying in Nova Scotia were excluded. A total of 1104 death certificates were reviewed and age at death, cause of death, performance of autopsy, and family physician and coroner were noted. With the permission of the Minister of Health, medical records and autopsy protocols were requested from family physicians and coroners when the death certificate indicated the cause of death as SIDS (N=205), pneumonitis (8), necrotizing bronchitis (2), bronchitis (2), asphyxia (3), or viral pneumonia (4). A total of 224 records and 165 autopsy protocols were requested and 130 medical records and 86 autopsy protocols were received.

Medical records were reviewed by one of us (CSC), a pediatrician, and autopsy reports were reviewed by a pediatric pathologist (SAH). Cases whose death certificate diagnosis had been SIDS were classified as "probable" SIDS, "possible" SIDS, or "unlikely" SIDS. "Probable" SIDS was applied to cases with clinical circumstances and an adequate autopsy that suggested no alternative cause of death. "Possible" SIDS was applied to cases whose autopsy was considered less than thorough but nevertheless failed to suggest an alternative diagnosis. "Unlikely" SIDS was applied to those cases in which clinical circumstances or autopsy revealed an alternative cause of death. If contradictory, autopsy data were felt to be more accurate than death certificate data and were used preferentially.

Non-SIDS deaths were divided into neonatal and post-neonatal deaths. A neonatal death was defined as occurring between birth and 28 days of age, while a post-neonatal death was defined as occurring between 29 and 365 days of age.

The number of live births in Nova Scotia for 1977 to 1985 was obtained from the Nova Scotia Regional Perinatal Program.

Comparison was made between the three-year period 1983 to 1985 and the earlier period of 1977 to 1982 because the SIDS death were consistently lower than previous years. The data were analyzed as a 2 x 2 contingency table using the Chi square as the test statistic.

RESULTS

Results are tabulated in Table I. While the number of live births has remained essentially constant during the nine year period of study, the total number of infant deaths, and therefore, the total death rate has fallen dramatically.

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TABLE I

Year	Live Births	Total Deaths No. (Rate)	SIDS No. (Rate)	Neonatal No. (Rate)	Post-Neonatal No. (Rate)
1977	12,449	143 (11.5)	31 (2.5)	91 (7.3)	21 (1.7)
1978	12,596	145 (11.6)	22 (1.7)	105 (8.3)	19 (1.5)
1979	12,444	146 (11.7)	24 (1.9)	87 (7.0)	35 (2.8)
1980	12,414	132 (10.6)	24 (1.9)	81 (6.5)	27 (2.2)
1981	12,178	138 (11.3)	24 (2.0)	92 (7.6)	22 (1.8)
1982	12,300	108 (8.8)	25 (2.0)	66 (5.4)	17 (1.4)
1983	12,426	114 (9.2)	19 (1.5)	73 (5.9)	22 (1.8)
1984	12,437	85 (6.8)	13 (1.0)	65 (5.2)	7 (0.6)
1985	12,394	92 (7.4)	18 (1.5)	57 (4.6)	17 (1.4)

Rate = Number/1,000 live births

From our review, 183 "probable" and 17 "possible" SIDS cases were diagnosed during this period. The seventeen "possible" SIDS cases included 5 infants less than 28 days of age, one possible homicide, 5 possible pneumonias, one infant with cardiomegaly, and one with possible myocarditis; in two, the clinical history was atypical and had no CNS examination at autopsy. The diagnosis of "unlikely" SIDS was made in 5 of the 86 cases (6%) whose autopsy protocols were available for review. These 5 infants are not included among the 200 SIDS cases listed in Table I.

One sibling pair was identified from the death certificates as dying for SIDS. Neither infant had an autopsy performed.

The incidence of SIDS declined from 2.5/1,000 live births in 1977 to 1.5/1,000 live births in 1985. The incidence of SIDS during the six-year period 1977 to 1982 (2.0/1,000 live births) was compared with the incidence during the three-year period 1983 to 1985 (1.3/1,000 live births) and the difference was found to be significant ($p=.016$). Similarly, significant differences were found between the incidences of total death ($p < .001$), neonatal deaths ($p < .001$), and post-neonatal, non-SIDS deaths ($p=.015$) in these two time periods.

DISCUSSION AND CONCLUSION

The incidence of SIDS in Nova Scotia from 1983 to 1985 of 1.34/1,000 live births is lower than that reported from many developed countries and is similar to that of the United States.[6] The rate of SIDS in the United States has remained remarkably constant, ranging from 1.5 to 1.4 per 1,000 live births from 1978 to 1983, the last year for which figures are available. This similarity supports our view that death certificate diagnoses as confirmed by complete autopsy is a valid method for the establishment of the SIDS rate.

The incidence of SIDS in Nova Scotia has fallen dramatically in the nine-year period from 1977 to 1985 and has paralleled a similar decline in the total infant death rate, neonatal death rate, and post-neonatal death rate during this same period. The cause of this decline is unknown but may be related to an improvement in perinatal care, maternal health, socioeconomic conditions, and/or the health care delivery system in general in Nova Scotia during these years. Other unknown factors may also be related.

□

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"If th' Christyun scientists had some sience an' th' doctors more Christyanity, it wudden't make anny diff'rence which ye called in — if ye had a good nurse."

— Finley Peter Dunne

Lower Genital Tract Dysplasia

CAUSES AND MANAGEMENT

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Epidemiologic data strongly suggests that precancerous and cancerous lesions of the uterine cervix are akin to a sexually transmitted disease. Multiple epidemiologic studies have identified early age onset of sexual activity, multiple partners and exposure to a "high risk male" as being significant in the development of these lesions.[1] The association with syphilis, trichomonas, gonorrhea, chlamydia and the herpes simplex virus have been found to be coincidental as they cannot be factored independently from sexual activity.[2]

It is now recognized that the human papilloma viruses (HPV) are STD pathogens of major epidemiologic importance, with a wider clinical spectrum and a higher epidemic incidence than previously suspected, with approximately 20% of the female population between the ages of 15-40 harbouring this virus. Studies are now suggesting that HPV may be an independent risk factor in the development of lower genital tract neoplasia.[2]

HPV VIROLOGY

The human papilloma viruses compose a heterogenous group of double stranded DNA viruses with a diameter of approximately 55 nanometers and a surface composed of 72 capsomeres. Within the virus particle itself there are a number of circular genomes each consisting of approximately 8,000 base pairs. There are currently over 50 identifiable subtypes of the human papilloma virus. These have been identified by linearizing each subtype's genome into what have been termed "open reading frames" to determine gene sequences and functions.[11]

Although these viruses tend to be species and site specific, they share the ability to induce squamous epithelial proliferations characterized primarily by hyperkeratosis and epithelial hyperplasia. They are unique in that HPV replication is linked to squamous epithelial maturation; productive infection requiring terminal differentiation of the upper, intermediate and superficial keratinocyte with whole virions localizing specifically within the nuclei of these cells. It is the dependence of viral replication of squamous maturation that has hampered the study of these viruses because of their inability to grow in culture.[19]

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EXISTING MODELS SUGGESTING CAUSATION

Naturally occuring animal models for the oncogenicity of the papilloma virus have been clearly defined. The bovine papilloma virus (BPV) incites the development of gastrointestinal tract papillomas within cattle. Malignant transformation is restricted to certain types of BPV in animals ingesting bracken ferns. In cotton-tailed rabbits (CRPV) skin papillomas may result in 25% undergoing malignant transformation.[3]

In humans, the disorder Epidermodysplasia Verruciformis (EDV) is a hereditary defect in cell mediated immunity which results in a predisposition to cutaneous HPV induced warts. The biologic potential would appear to be related to the HPV type and environmental influences, an example being that HPV 5 when exposed to the ultraviolet light of the sun results in a 35% incidence in squamous cell carcinoma of the skin.[3]

HISTORICAL BACKGROUND

In 1974, zur Hausen postulated that HPV were likely candidates for sexually transmitted agents which could result in genital tract squamous neoplasms.[4] Meisels in 1977 began a series of papers drawing attention to condyloma virus induced lesions of the cervix, and described the presence of intranuclear HPV in the koilocytotic cells of putative cervical squamous cancer precursors. It was noted that these viruses, which had traditionally been associated with classical cauliflower-like venereal warts, could also product flat, white lesions in the genital tract of the type which, cytologically, colposcopically, and histologically had commonly been thought to be associated with the production of cervical squamous cell cancer. Shah and Jensen subsequently produced antibodies to HPV capsid antigens which allowed investigators to identify the presence of papilloma viruses, using a relatively simple immunoperoxidase staining procedure.[6] This technique led to articles confirming and extending the original observations of Meisels. The next breakthrough came when zur Hausen and others isolated HPV from human genital tract lesions and, through the use of molecular cloning, were able to secure sufficient amounts of HPV DNA to type the viruses using standard hybridization procedures.[7]

These hybridization studies were based on Southern's technique of Southern Blot Hybridization.[8] The basic method is to expose specific radiolabelled HPV DNA

to cellular DNA extracted from tissue samples. Samples that contain similar DNA sequences will bind denoting a positive sample which can be identified via autoradiography.

HPV AS THE DRIVER?

Papilloma viruses have been numbered according to their order of discovery, and, at the present time there are over 50 known and numbered HPVs. Of these, 9 are commonly found in the female genital tract. HPV types 6 and 11 are found in the acuminate wart as well as the flat, white lesions and types 16, 18, 31, 33, 35, 39, and 42 are found in cervical cancer. The evidence is accumulating that HPV are etiologically important in the genesis of squamous neoplasms of the male and female genital tracts as well as many other epithelial sites. Although rigorous proof is lacking that the papilloma viruses are the direct cause of these squamous neoplasms, the strength of the association between the two and the findings relating to this association provides strong support for their being etiologically important. The evidence linking papilloma virus infection to the genesis of squamous neoplasia of the genital tract may be briefly summarized as follows:

1. *Squamous cancers of the cervix contain HPV in 90-95% of cases.*

In the initial studies of squamous cell cancers of the cervix it was reported that approximately 60-70% contained HPV. As new viruses which are associated with genital tract neoplasia have been found, the proportion of cases associated with the presence of the virus have increased such that currently HPV can be detected in 90-95% of all squamous cell cancers of the cervix.[9] It has been speculated that 5% of the cases in which HPV is currently not found represent additional rare viral types which have yet to be identified, or cancers in which the number of viral particles is so low as to make their detection difficult.

2. *Most tissue culture cell lines derived from cervical cancer contain HPV.*

It is impossible at this time to propagate HPV in tissue culure systems but it has been found that the virus, when present, is integrated into the host genome in tissue culture lines derived from cervical cancers. Using these cell lines, it has been found that the circular viral DNA consistently opens at the E-1, E-2 open reading frame to integrate in the host DNA. It has also been shown that the viral DNA is actively transcribed and that the E-6, E-7 open reading frame is consistently read along with fusion products from the adjacent host DNA.

3. *Presumed cervical squamous cell precursors contain HPV in approximately 90% of cases.*

As in the invasive squamous cell cancers and in the precursors, the proportion of cases found to contain HPV has increased with the number of viral types identified and with the increasing use of Southern blot hybridization techniques to identify the presence of virus. Although the immunoperoxidase stain is positive in less than half the cases identified, it is now recognized that his technique is relatively insensitive and requires complete virion for its successful application, is seldom positive in lesions which do not have koilocytosis, and is informative only if it is positive. The fact that a high proportion, both of squamous cell cancers and precursors contain HPV, argue strongly for its importance.[3]

4. *HPV types 6/11 are rarely found in invasive squamous cell cancers but are found in acuminate warts and in flat condyloma.*

HPV 6/11 lesions have a high regression rate, a low persistence rate, and virtually no progression. There is a high degree of correlation between the viral type and the biologic behavior of the lesion which it produces. HPV types 6 and 11 are rarely found in invasive squamous cell cancer. Thus, these viral types appear not to have a particularly important association with the production of neoplasia.[11] Verrucous cancers contain HPV 6/11. These malignancies are generally locally invading lesions which rarely metastasize and the HPV is generally found in an episomal (non-integrated) state. It is important to note that these generally localized lesions can be converted to highly malignant cancers which metastasize widely if they are irradiated.

5. *HPV types 6/11 are associated with polyploidy and with normal mitotic figures or tripolar mitoses.*

Heteroploidy is a marker for HPV infection. Polyploidy, in contrast to aneuploidy, identifies the lesion which fails to progress. There is a high degree of correlation between HPV 6/11 polyploidization and a clinically benign course. The pathologist can, at the light microscope level, identify the cervical lesion which is associated with HPV 6/11 infection by virtue of the high degree of koilocytosis, surface maturation and the lack of abnormal mitotic figures.[12]

6. *HPV 16/18 and others are found in invasive squamous cell cancer.*

HPV 16 is found in approximately 50% of invasive cancers, HPV 18 in approximately 20% and other members of this group in smaller percentages varying from 2%-4%, the ratios varying for different geographic areas. These viruses are consistently found in an integrated form except for a small number of cases in which the virus is episomal but in which there are viral structural rearrangements.[11] In addition to the squamous cell lesions, HPV in the 16/18 group are found in many cases of adenocarcinoma and adenocarcinoma in situ of the cervix.[13]

7. *The HPV 16/18 group of viruses is consistently found in presumed squamous cell cancer precursors.*

The non-HPV types 6/11 induced genital lesions contain the same viral types as are found in the invasive

squamous cell carcinomas and in similar proportions. In the lesions infected with the HPV 16/18 group, regression is uncommon and persistence and progression are the rule. There is a high degree of correlation between the viral type found in the precursor, its clinical behavior and the viral type found in the invasive carcinomas.[11]

8. *HPV 16/18 group induced lesions are aneuploid and contain abnormal mitotic figures.*

There is a high degree of correlation between infection with HPV type 16/18 and the presence of aneuploidy and abnormal mitotic figures including 2-group and 3-group metaphases, multipolar mitoses, highly atypical mitotic figures and coarsely clumped chromosomes. Lesions with aneuploidy and abnormal mitotic figures are unlikely to regress and have a high persistence and progression rate.[11 12]

9. *The physical state of the papilloma virus in the cell differs depending upon the viral type.*

HPV types 6/11 are consistently found to be episomal and not integrated in the host cell genome. In contrast, infections with HPV 16/18 viruses consistently result in viral DNA integration except in those rare cases in which the virus is found episomally but has structural rearrangements. In some cases in which HPV integration occurs episomal virus is found as well but the viruses physical state is remarkably correlated with clinical course.[11]

Bowenoid papulosis is a lesion which is histologically indistinguishable from VIN 3 (carcinoma in situ). It presents most commonly as multiple lesions with a dusky hue in young (particularly pregnant) women. This clinical appearance is associated with a propensity towards spontaneous regression and, despite its ominous histologic appearance, Bowenoid papulosis, whether occuring on the vulva or on the penis, has been viewed as being less portentious than classical in situ lesions of the vulva or penis. Bowenoid papulosis is associated with HPV types 16/18 but, unlike invasive squamous cell cancers in which the virus is nearly always genomically integrated, the virus is found episomally in the Bowenoid papulosis lesions.[14] Recently, concommitant invasive carcioma of the vulva associated with Bowenoid papulosis and HPV type 16 has been reported suggesting that some cases of Bowenoid papulosis do behave aggressively.[20]

10. *The HPVs are transcriptionally active in human cervical squamous cell cancer cells.*

The fact that transcription takes place in the genomically integrated virus in squamous cell cancers and that a putative transforming segment, the E-6, E-7 open reading frame is consistently transcribed argues strongly that the virus is playing a role in the pathogenesis of human genital tract cancer and is consistent with the action of other oncogenic viruses in other animal systems.[11]

11. *The relative risk of patients with HPV induced cervical lesions is substantially greater than appropriate chosen controls.*

A high proportion of HPV 6/11 induced lesions fall into the mild dysplasia or cervical intraepithelial neoplasia Grade I, (CIN I) histologic classification. Yet some CIN I lesions contain HPV 16/18 group viruses. It has been calculated that the relative risk of patients with CIN to be approximately 1212 times greater than that of the general population. In CIN II the ratio of HPV 6/11 to 16/18 lesions is in favour of the 16/18 group and the relative risk would appear to be about 1515 times that of controls. In the CIN III lesions almost all are HPV 16/18 group, and the relative risk is about 2020 times that of the controlled population. In classical carcinoma-in-situ, almost all the lesions are infected with the HPV 16/18 group and the relative risk of progressing to invasive squamous cell cancer when followed prospectively is at least 70% after 12 years of follow-up. Knowing that HPV induced lesions confer an increased risk on a patient with such lesions again strongly suggests an important etiologic relationship in the production of squamous neoplasia in humans.[9]

HPV AS THE PASSENGER?

The enthusiastic reception of the concept that HPV plays an important role in the development of precancerous lesions and cancer of the uterine cervix and the lower genital tract, has significantly obscured the fact that very little is known or understood about the virus-tissue interaction and about the sequence of events leading from sexually transmitted viral infection to cancer. As outlined, current evidence implicating HPV infection in cancer of the cervix (and the lower genital tract) is substantial but remains somewhat circumstantial, mainly because no satisfactory experimental model of HPV tissue interaction exists today.

The following facts remain puzzling:

1. The recently reported incidence of HPV infection with multiple viral types in 11% of disease free women and 5.5% of disease free men clearly indicates that infection per se is not a sufficient condition for neoplastic events to occur.[9]

2. The highly unpredictable behavior of HPV associated lesions may not be fully explained by viral types. Lesions associated with HPV 6/11 have been shown to rarely progress to carcinoma-in-situ, albeit at a somewhat lower rate than lesions associated with HPV 16/18. This finding may be related to a mixed HPV infection with an as of yet unidentified HPV subtype.

3. The viral DNA is episomal (not integrated) into cellular DNA in many precancerous lesions but is integrated in invasive cancer.

All of these observations suggest that the induction of neoplastic events other than condylomas by HPV infection is a highly selective process that affects some women, probably only a small proportion of the infected population, and is exceptional in men. The disappearance, persistence or progression of the HPV associated neoplastic events is an extremely complex multistage process that presumably requires a large number of incidental biologic events to come together.

PUTTING THE CURRENT DATA TOGETHER

Zur Hausen has postulated the HPV functions as a promoter producing clones of cells susceptible to initiating events by other carcinogens.[11] Undoubtedly, the direct cause and effect association between particular HPV types with neoplasia is an over simplification of the molecular events in carcinogenesis.

Sinergistic environmental carcinogens and the prevailing host immune system undoubtedly play a substantial role in the pathogenisis of lower genital tract neoplasia.

Recent epidemiologic studies have identified smoking as an independent risk factor in the development of cervical cancer.[16 17] Studies have demonstrated significant levels of cigarette smoke metabolites (nicotine and cotinine) in cervical mucus. The herpes simplex virus (HSV) and the cytamegalovirus (CMV) are known to be mutogenic. There are indications that HPV DNA integration into the host cell DNA may be enhanced by HSV and CMV.[18] High levels of local nitrosamines within the genital tract secondary to chronic infections may play a role. Other factors which may contribute are a nutritional deficiencies in Vitamin A, C, and folate.

Immunosuppression is well recognized as providing a background for the enhancement of malignant transformation, by predisposing to viral infection and allowing neoplastic proliferation to escape host regulation and immune surveillance. In female renal transplant patients, the prevalence of genital tract HPV is nine times that of the general population. The rate of cervical intraepithelial neoplasia can be up to 16 times that of the general population and nine times that of normal matched controls.

Although our understanding of the HPV infection and its relationship to carcinoma of the female genital tract is at its beginning, the current data support the concept that HPV plays an important role in the multifactorial etiology of lower genital tract neoplasia. The data provides a molecular and theoretic frame work upon which to base further studies to clarify the issue.

TERMINOLOGY

Some clinicians continue to regard dysplasia as one disease and carcinoma-in-situ as another. This two disease concept has led in some cases to the use of a surgical approach in the treatment of carcinoma-in-situ (CIS) and a lesser degree of intervention for dysplasia.

Current data are consistent with a two-disease system in the genital tract but it appears to be an HPV 6/11 versus an HPV 16/18 group system rather than a dysplasia versus CIS system. The classical histologic distinction between mild, moderate and severe dysplasia and carcinoma in situ or CIN I, CIN II, and CIN III would appear to reflect the relative proportion of HPV 16/18 group associated lesion. It would, therefore, be useful for the clinician to know the patient's HPV types(s) because the patient's at risk status is principly dependent upon HPV type versus histologic grade (although the histologic grade reflects in aggregate the HPV type). An example is the 5-10% of CIN I lesions which contain HPV 16/18 and will eventually progress.

Based upon this current understanding, Dr. Ralph Richard[9] has suggested that in cervical lesions the dysplasia/CIS dichotomy be replaced by a more specific diagnosis:

1. Normal and its varients
2. Flat condyloma (usually well differentiated)
3. CIN (regardless of histologic grade)
4. Microinvasive carcinoma
5. Frankly invasive carcinoma

Dr. Richart contends that the pathologist should be able to make the distinction in the cervix between HPV type 6/11 and HPV type 16/18 group lesions based upon:

1. The proportion of koilocytes in the lesion
2. The number of mitoses in the upper third of the epithelium
3. The proportion of undifferentiated cells in the upper third of the epithelium
4. The degree of nuclear pleomorphism
5. The presence of abnormal mitotic figures

The clinically useful distinctions are normal and its varients versus HPV induced lesion. Within the spectrum of HPV induced lesions the relative diagnostic bifurcations are: Cancer/not cancer and in the non-cancer group HPV 6/11 induced lesions versus HPV 16/18 group induced lesions.

The transition from the current terminology may be further aided by the technique for in situ hybridization and HPV/DNA typing which are now being developed and which should enable the medical community to screen patients for specific HPV types in the clinical setting.

PRINCIPLES OF MANAGEMENT

Any patient with evidence of a HPV infection at any site in the genital tract has a high risk of having an HPV induced lesion in other portions of the genital tract as well. A patient with cervical lesions may, in addition, have lesions of the vulva, the urethra, the clitoris, the perineum or the anus. These may be acuminate warts, flat condylomata, vulvar intraepithelial neoplasia (VIN), vaginal intraepithelial neoplasia (VAIN), perineal intraepithelial neoplasia (PEIN), or perianal intraepithelial neoplasia (PAIN). Patients are at risk of having more than one HPV type in the same lesion or of having multiple lesions which may differ in their HPV type.

Although the pap smear is a highly effective screening technique, it must be remembered that it is not a diagnostic tool and serves principly to identify those patients who require a diagnostic work-up. The only thing that an abnormal smear tells the clinician is that the patient is at high risk. The degree of risk must be evaluated by further diagnostic procedures.

It is now generally agreed that colposcopy is obligatory as the first step in the work-up of the patient with an abnormal smear. Colposcopy is not a diagnostic technique but a triage technique and, although a tentative colposcopic diagnosis should be entered on the chart for internal quality control, it must be remembered that histologic evaluation of a biopsy is the only definitive diagnostic test.

In the hands of a competent colposcopist, the combination of cytology, colposcopy, multiple cervical punch biopsies and an endocervical curettage should be highly effective in distinguishing between patients who have cancer and must be treated as such; patients who have CIN or flat condyloma and can be treated on an out-patient basis; or patients who have a lesion which cannot be placed in one of these categories due to the colposcopic examination being unsatisfactory. Using such a redundant system, in which cytologic, colposcopic and histologic studies are designed to complement one another and to study each patient extensively, should significantly reduce the risk of missing an invasive carcinoma and the inappropriate treatment of the patient with cancer as if she had a cancer precursor.

Patients in whom the distinction between cancer and not cancer cannot be made on an out-patient basis for whatever reason will require a diagnostic conization. If possible, the cone margins should be chosen colposcopically and, in the non-pregnant patient or the patient who will not require a hysterectomy for other reasons, an attempt should be made to make the cone therapeutic as well as diagnostic.

For patients who are out-patient treatment candidates (in whom invasion has been ruled out and in whom the lesion is of such a size and distribution as to be treated on an out-patient basis) the two principle modalities which have been used for treatment are cryotherapy and carbon dioxide laser therapy. Radical elective coagulation, hot wire excision and cold cauterization also have been used with good results.

The cure rates for flat condyloma and CIN appear to be identical for lesions less than 3 cm in size and confined to the portio without any extension into the lower endocervical canal whether cryotherapy or the carbon dioxide laser are used. It is, therefore, recommended that in view of its lower morbidity and cost that cryotherapy continue to be used for such lesions. In instances where the lesion is large, or extends into the lower endocervical canal, or the cervical topography is not suitable for the cryotherapy probe, CO_2 laser therapy is the more appropriate first choice of management.[21] It should be noted that if patients who are treatment failures by either modality are retriaged and retreated the successful treatment results using cryotherapy or CO_2 laster therapy are indistinguishable and approximate 90-95% of out-patient treatment candidates.[9] It is of great importance for the clinician to remember that any patient who is a treatment failure may be so because of an invasive cancer being undiagnosed and treated as CIN, hence, patients who are treatment failures must undergo colposcopy and be evaluated with great care to be certain that invasion is not present.

One of the highly debated questions is whether HPV 6/11 induced lesions should be treated or whether the patient should be followed to see what the clinical course of her lesion will be. The argument in favor of following patients without treatment is that as 50% of HPV 6/11 lesions may regress. Therapeutic intervention may not be appropriate unless the lesion persists or progresses. The argument in favour of treating patients with HPV 6/11 induced lesions is that if a patient with a known STD remains untreated there is the risk of creating new infections if sexual intercourse with new partners takes place. In addition in many patients, it may be difficult except in expert hands to determine whether only a HPV type 6/11 lesion is present or whether there is a mixed infection with one of the HPV type 16/18 group viruses, or additional lesions that may contain viruses different than those in the biopsied lesions. It is also a question of whether the expense and complications of treating a patient is greater to, equal to, or less than that of following them periodically for extended periods of time.

There is no debate as to whether true CIN containing viruses from the HPV type 16/18 group should be treated. This tenent is universally accepted.

Practical therapeutic interventions for vaginal intraepithelial neoplasia include: excision, carbon dioxide laser and 5FU. Treatment is usually restricted for high grade lesions with VAIN I and II often

followed colposcopically. The abnormalities tend to be in the upper third of the vagina with current evidence suggesting that excision remains more efficacious than the carbon dioxide laser when treatment is indicated.[22]

Vulvar, perineal and perianal intraepithelial neoplasia again if of low grade and asymptomatic can be followed colposcopically. Symptomatic and/or higher grade lesions, which require therapeutic intervention, can be managed by simple excision with primary reapproximation or, if larger areas are involved, a skinning procedure with or without grafting. The carbon dioxide laser can be utilized in these instances but it must be remembered that this does not provide a histologic specimen and, therefore, the colposcopist needs to be absolutely certain of not missing an early invasive lesion.

The management decisions for the future appear to be complex. A screening test for HPV/DNA in asymptomatic putatively normal populations has shown that a high proportion of the population carries this virus in the genital tract. As many as 10-20% of men and women harbour HPV when screened using hybridization techniques, and more than 66% of such individuals have neither a clinical lesion or an abnormal pap smear. The natural history of such subclinical infections is currently being studied by a number of groups but data on which to base clinical or therapeutic recommendations are not yet available. However, as simpler HPV/DNA screens become commercially available and as the cost of performing such procedures becomes affordable, it will be possible to be more precise in assessing an individual patient's lesion(s) and in determining and monitoring the appropriate therapeutic approaches and follow up procedures.

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Current Topics in Community Health

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NEW PROGRAM AIMS TO REDUCE CARDIOVASCULAR DISEASES

A special program designed to prevent cardiovascular diseases — mostly heart attacks and strokes — was officially launched on March 2, 1988 in Halifax.

The Nova Scotia Heart Health Program is being offered by the Nova Scotia Department of Health and Fitness in cooperation with Health and Welfare Canada.

As part of the opening ceremonies, the Honorable Joel R. Matheson, Nova Scotia Minister of Health and Fitness and the Honorable Jake Epp, Minister of National Health and Welfare, signed an agreement pledging federal-provincial cooperation aimed at ensuring the success of the program.

Mr. Matheson explained the program will have two objectives, one directed towards helping the population at large achieve or maintain heart health. The other will assist those at high risk to reduce their chances of developing cardiovascular disease.

"Creation of this special program within our provincial health and fitness department represents a major shift towards prevention of chronic disease and disablity caused by cardiovascular disorders," continued Mr. Matheson.

Mr. Epp noted the Nova Scotia program is "a key project enabling us to put into practice recent advances — in which Canada is recognized as a world leader — in our concepts of health promotion and disease prevention.

"This initiative is the first of a number of similar provincial activities anticipated to develop across Canada. Health and Welfare Canada is prepared to cooperate with all provinces wishing to develop integrated commuity-based programs to improve the heart health of their citizens," said Mr. Epp.

The Nova Scotia project is also the first Canadian effort developed as part of the World Health Organization's Countrywide Integrated Non-communicable Diseases Intervention (CINDI) program. An Understanding for Canada and Nova Scotia to participate in the CINDI program was signed by the two Ministers today.

A recently completed heart health survey in Nova Scotia revealed that many Nova Scotians are at increased risk for cardiovascular disease because of cigarette smoking, high blood pressure or elevated blood cholesterol levels. The survey was a joint effort of the federal and provincial health departments.

The provincial and federal governments are sharing technical as well as financial resources and will be working with a variety of groups including the Nova Scotia Heart Foundation, the Medical Society of Nova Scotia, Dalhousie University and the food industry to develop a broad public health partnership promoting heart health.

The federal government's contribution includes funding totalling $950,000 over the next five years from Health and Welfare Canada's National Health Research and Development Program (NHRDP). A similar level of support will be provided by the Province.

Source: Nova Scotia Department of Health and Fitness, and Health and Welfare Canada.

LIFE EXPECTANCY BY SEX, AGE, AND INCOME LEVEL IN CANADA

Life expectancy is a hypothetical measure and indicator of current health and mortality conditions. The life expectancy according to income level can be used to study the association between income and the risk of death due to all causes. Table I shows that life expectancy in Canada increased monotonically with income level. The difference in life expectancy by income level was greater for males than females at all ages. The difference for each sex was greatest at birth, relatively constant up to age 35 and declines rapidly after age 45. For females over 55 and males over 75, this difference is less than one year.

The relationship between income level and life expectancy must be carefully interpreted; an association should not be confused as a causal relation. Income level is correlated with factors such as education, occupation and lifestyle which can independently contribute to the risk of disease. Chronic disease and disability may cause a decline in income level due to loss of employment or a decline in job status and pay; thus, a relatively low income at the time of death can be a result of disease as opposed to a cause. The correlation observed from the life table does not imply that income per se directly influences life expectancy. Income should be considered as a socioeconomic status indicator. The results indicate that the residents of high socioeconomic status areas live longer than those of the low socioeconomic status areas.

TABLE I
(abridged)

LIFE EXPECTANCY BY SEX, SELECTED AGES AND INCOME LEVEL

Sex	Income Level 1 (High)	2	3	4	5 (Low)	Total
Males						
1	75.36	74.22	73.09	72.42	69.71	73.00
5-9	70.95	69.95	68.90	68.33	65.75	68.79
15-19	61.08	60.14	59.08	58.60	56.01	58.98
25-29	51.67	50.75	49.81	49.27	46.72	49.64
35-39	42.12	41.26	40.48	39.85	37.42	40.19
45-49	32.63	31.86	31.04	30.69	28.52	30.89
55-59	23.68	23.10	22.46	22.21	20.61	22.29
65-69	15.98	15.56	15.12	15.00	13.97	15.00
75-79	9.72	9.65	9.37	9.24	8.89	9.31
85+	5.70	5.87	5.22	5.26	5.05	5.37
Females						
1	81.00	80.93	80.00	79.30	78.59	80.06
5-9	76.57	76.59	75.67	75.10	74.58	75.78
15-19	66.69	66.71	65.82	65.26	64.77	65.92
25-29	56.90	56.91	56.10	55.51	55.01	56.15
35-39	47.11	47.17	46.32	45.81	45.37	46.41
45-49	37.49	37.59	36.70	36.38	36.09	36.88
55-59	28.29	28.46	27.59	27.44	27.36	27.83
65-69	19.82	20.14	19.24	19.25	19.33	19.59
75-79	12.58	12.93	12.07	12.20	12.37	12.47
85+	7.10	7.76	6.67	6.99	7.53	7.21

Source: Abridged from Anne-Marie Ugnat, Elen Mark in: *Chronic Diseases in Canada* 1987; **8,1:** 12-13 (complete article including methods, table and references available on request).

Comment

There are few more powerful influences on community health status than the many factors associated with the poverty state. The power of poverty to influence disease incidence and prognosis has been demonstrated time and again in history. This is true internationally and in all regions of Canada. In 1980 Health and Welfare Canada published a landmark analysis of mortality by income level in urban Canada, and strong gradients were identified for the majority of diagnostic categories.[1] In 1982 the problem of inequalities in health was considered so serious in the United Kingdom that it stimulated the release of the Black Report, heralded as "the most important critique of the health service and general health standards written in this country since the war".[2]

Actions to alleviate the inequalities associated with poverty are the very foundation of our public health and social service systems, and underlie the more recent introduction of hospital and medical care insurance across Canada.

F.W.

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TECHNOLOGY, SAFETY AND DEEPSEA FISHING

A variety of technological and other changes have taken place in the trawler branch of the deepsea fishery which should have contributed to a reduction in accident rates during the past ten years. These changes include the shift from side to stern trawlers, unionization and the associated introduction of per diems and limits of a series of recommendations from the Big Fishing Vessels Safety Committee. Evidence suggests that despite these changes, accident rates have not declined and may even have increased.

Trawling is clearly one of the most dangerous occupations in Canada today. The high accident rate on trawlers is often attributed to the hazards of working in a marine environment but evidence suggests that many of those accidents that occur are similar to those which happen in any industrial environment and are equally preventable.

The report explores a variety of factors that seem to have contributed to problems with health and safety on trawlers. These factors include the absence of health and safety legislation and regular inspections of the fishing gear and work practices on trawlers, the continued importance of incentive payments in determining the incomes of trawler-workers, pressures from management to increase productivity, and the decision to send trawlers which were not designed for fishing in ice, into the ice in order to harvest the northern cod stock. Analysis also suggests that although stern trawler technology is better designed for fishing in a marine environment and the fishing and processing technology is more safely designed, with stern trawlers, control over the pace of the fishing effort is transferred from the workers to the skipper. This allows skippers to increase the pace of harvesting thereby increasing the risk of accidents and stress among workers. There is also evidence that the marine, fishing and safety technology on the older sides and sterns has been inadequately maintained by the companies thereby contributing to the risk of injury and death.

The reports recommendations are:

- Deepsea fishermen and other fishermen as well, must be covered by the same health and safety provisions as other workers in Canada. The legislative protection contained in Part IV of the Canada Labour Code must be extended to deepsea fishermen.
- The right for trawler-workers to refuse work they consider to be hazardous must be incorporated into the Canada Labour Code legislation.
- GSI inspectors must be able to intercept vessels while fishing at sea, if they are to be effective in helping to protect the occupational health of trawler-workers.

- In order to speed up the development and enforcement of effective occupational health and safety legislation for trawlers, some of those formerly injured trawler-workers who are experienced with fishing and processing gear but no longer able to work as trawler-workers should be hired and trained as inspectors and/or to play an educational role in the fleet.
- The companies should not be allowed to eliminate per diems in the trawler fishery and every effort should be made to decrease the percentage of trawler-workers' incomes that are dependent on the size of the catch.
- A system of penalties and protections for skippers must be introduced that will encourage them to give priority to health and safety issues.
- The removal of mates and chief engineers from the union would entail an increased risk to the occupational health of trawler-workers and should be opposed.
- Emergency air lift services need to be implemented by one or more support vessels capable of providing medical services and/or transporting injured fishermen to shore and notifying their family members. These mobile facilities could also carry safety inspectors.
- Trawlers must carry more adequate medical supplies and trained medical personnel so that injured workers will be assured of correct treatment and some kind of informed assessment can be made of the extent of their injuries during the interim period between the accident and the arrival of help and/or support services.
- Some system needs to be introduced which allows time for training but which does not pose a threat to the income of other workers. One possible system would involve the introduction of a bonus system on vessels where trawler-workers could also be offered a bonus for training other workers.
- The three week Marine Emergency Duties course should be required and available in the areas of Newfoundland where most trawler-workers presently live. Some system of economic incentives should also be introduced so that they will not be penalized financially for taking this course.

Source: From the Executive Summary of a recently released report entitled *The Social Impact of Technological Change in the Deepsea Fishing Industry in Newfoundland* as republished by the Canadian Centre for Occupational Health and Safety, *At the Centre* 1987; Vol. X., No. 5. A summary of the whole report is available at $6.25 (prepaid or purchase order) from the Institute of Social and Economic Research, Memorial University of Newfoundland, St. John's, Newfoundland, A1C 5S7. □

National Guidelines on Prenatal Nutrition now Available

Copies of national guidelines on nutrition for pregnancy, are now available to physcians in Nova Scotia. Developed as a joint federal-provincial project aimed at maintaining and improving infant and maternal health in Canada, these guidelines complement and support existing prenatal nutrition programs in community based health services.

An advisory group composed of practitioners and academics representing the practical and scientific aspects of medicine, nursing and nutrition prepared the guidelines.

A consensus was reached on such controversial matters as acceptable levels of prenatal weight gain, the consumption of aspartame during pregnancy and maintenance of dental health of pregnant women and infants. Other topics covered by the guidelines include dietary practices during pregnancy, nutritional needs of pregnant adolescents and use of herbal teas.

Through a question and answer format and an extensive bibliography, the publication addresses nutrition problems seen by health professionals on a day-to-day basis.

Seven national professional associations have endorsed the guidelines: The Canadian Medical Association, Society of Obstetricians and Gynecologists of Canada, Canadian Nurses Association, Canadian Dietetic Association, Canadian Institute of Child Health, Canadian Cerebral Palsy Association and Canadian Pediatric Society.

Single copies of the publication, entitled *"Nutrition in Pregnancy - National Guidelines"* are available free of charge to physicians in Nova Scotia by contacting their closest community health nutritionist, located in Health Units across the province. □

Appreciations

DR. DAVID BRENTON ARCHIBALD

The medical profession and the community, alike, are feeling the acute loss since the death of Dr. David Brenton Archibald in September 1987.

Dr. Archibald received his schooling in Sydney Mines and Rothsay Collegiate as well as, later, Kings College and Dalhousie University Medical School. He eventually received his certification in urology and was a member of the Royal College of Surgeons (Canada). He practised urology, where he had his office, and the Northside area for over forty years. For the last five years, his office base was in North Sydney.

He enjoyed skating, walking, gardening, and fishing. He spent what time he could at the summer cottage and in his motor home where he and hiw wife took somelengthy trips.

Dr. Archibald's wife, Phyllis and his daughter, Marguerite, live in Sydney Mines.

Paul C. Boyd, M.D.

DR. JAMES JOSEPH (J.J.) CARROLL

Dr. J.J. Carroll recently passed away on December 14, 1987 at the R.K. MacDonald Nursing Home in Antigonish.

Born in Worcester, Mass., he was a son of the late William A. and Emma (McManley) Carroll. He graduated from St. Mary's University and Dalhousie Medical School, in Halifax, in 1924. From 1924-28 he practised medicine at the Lady Northcliffe Hospital, Grand Falls, Nfld., and for a year he practised at St. Joseph's Hospital, Glace Bay.

He joined the staff at St. Martha's Hospital in Antigonish on March 19, 1930. He was president of the St. Martha's Hospital medical staff and the Nova Scotia Medical Society. He received the Doctor of the Year Award from the Canadian Medical Association in 1973. He received an honorary Doctor of Law degree from St. Francis Xavier University in 1974. He retired from active practice in December of 1977, having served his patients faithfully for 53 years.

A senior citizens' complex, the J.J. Carroll House in Antigonish was named for him in 1975. He was also named honorary chairman of the CAMR in Antigonish. He was a member of the St. Ninian's Council of the Knights of Columbus.

He is survived by his sister, Laura Boyle of Halifax; a brother, William, Shediac, N.B.; four nephews and a niece. He was predeceased by his wife, Betty; two sisters, Helen Robertson and Margaret; three brothers, Rev. Francis L., John R. and Charles.

Dr. J.J. Carroll will be sadly missed as he has touched the lives of most of the residents of the Antigonish town and county over the past 50 years.

P.L. Allan, M.D.

DR. IVAN EDWARD CARTER

When on February 29, 1988, Dr. Ivan Carter died, it was a tremendous shock to his patients, colleagues, friends and, of course, his family.

Ivan was born and educated in England and received his medical undergraduate education from London University. He then worked as a house physician at St. George's Hospital in London and as a Registrar in Psychiatry at St. Andrew's Hospital in Northampton.

He came to Canada in 1965 where, after a rotating internship in Hamilton, Ontario, he spent five years in family practice in Caledonia, Ontario. He then returned to his psychiatry training which was completed at McMaster University in 1973 and he became a Fellow of the Royal College of Physicians, specialist in Psychiatry, in 1974.

He was a Lecturer and then Assistant Professor in Psychiatry at McMaster University and became Head of Psychiatry at the Chedoke Child and Family Centre in Hamilton in 1977. In 1978 he accepted a post in Leicester, England, as Consultant in Psychiatry and Adolescent Psychiatry. In 1981 he became Chairman of their subdivision of Child and Adolescent Psychiatry and in early 1982 Chairman of their Division of Psychiatry.

In 1982 Dr. Carter once again returned to Canada where he joined Dalhousie University as an Assistant Professor and the Izaak Walton Killam Hospital as Director of its Out-Patient Psychiatry Clinic.

At the time of his death, he was Associate Professor of Psychiatry and involved in numerous committees and projects relating to psychiatric education and the delivery of psychiatric services for children and families. He was Chairman of the Psychotherapy program for psychiatry residents at Dalhousie, a Member of the Professional Standards and Practice

Council of the Canadian Psychiatric Association, Member of the Metropolitan Mental Health Planning Board's Children's and Adolescent's Services Committee, and Chairman of the Local Arrangements Committee for the upcoming 1988 meeting of the Canadian Psychiatric Association in Halifax.

Dr. Carter who had pioneered certain outreach community consultation services in child psychiatry in Nova Scotia, had been a regular consultant to the Cape Breton Mental Health Centre in Sydney since 1983 and to Valley Mental Health Services since 1986. In the last two years with tremendous enthusiasm and energy, he had thrown himself into the development of a program that would coordinate child mental health services and initiate crisis assessment throughout Nova Scotia.

Dr. Carter will be remembered for his innovative drive, his educational aptitudes, his psychotherapeutic skills, particularly in the area of family therapy and for the many special ways in which he affected his patients and all those who worked with him. He will be missed for his charm, his unique sense of humour, and his devotion to the care of children.

We extend our sincere sympathies to his wife, Morag, and his children, John, Anne Marie and Robert.

H. Orlik, M.D.

DR. ALBERT M. SINCLAIR

Al, better known as "Sinc" to many was chief of Paediatric Orthopaedics at the Issac Walton Killam Hospital and Associate Professor at Dalhousie prior to his death November 19, 1987. Born in P.E.I., he graduated from Dalhousie in 1951 and did his Orthopaedic residency in Vancouver. This was followed by a Travelling Fellowship in Exeter, England.

He established a practice in Halifax in 1958, confining it to children in 1968. He was a staunch supporter of the Ability Foundation Travelling Clinics, a founding member of the Atlantic Provinces Orthopaedic Society, committee member of Canadian Orthopaedic Association and a keen participant in the N.S. Liberal Association.

The above may not be known to all, may be forgotten by some, but Al's personal qualities were appreciated and will not be forgotten. He had a cheery smile and hello for all; an endless supply of stories and an unbelievable memory for names. He had an anecdote to fit most clinical situations to reinforce some teaching point. His motto was "first do no harm". There are many families who after these years will miss his wise advice and remember his personal warmth and wit forever.

Al was a busy clinican guiding the development of Children's Orthopaedics in Nova Scotia. He struggled with a critical illness six years ago, overcame that only to be struck down again six months ago. Throughout this time he was a lesson to the rest of us in keeping a cheerful countenance and showing great courage when his personal future looked bleak.

Above all Albert was a family person. His life with Audrey and their six children, their friends and relatives; in Halifax and at their beloved cottage on the Northumberland Strait, was central in his life and heart.

The delight of his first grandchild gave profound meaning to the last few months of his life and the memories of family times and traditions are a precious heritage that will endure for all.

Douglas D.S. Brown, M.D.

DR. R. CLARENCE YOUNG

The medical profession, and Pictonians in particular lost a friend and eminent practitioner of the art of medicine in the recent sudden passing of "Dr. Clarence".

A member of a long-time Pictou family richly contributing to the medical profession and the welfare of others, Dr. Clarence was for many years Pictou County's only Internist. Raised in a home from where his father, "Dr. M.R.", spent many long hours engaged in house calls throughout the County, it was only natural that he should persue a career as a medical doctor. Interestingly so too did his late brother, "Dr. Fraser"; while his late sisters, Hildred and Pearl, sought careers as a Registered Nurse and Missionary respectively.

Clarence joined his father in general practice in Pictou upon his graduation from Dalhousie in 1942. By 1948 he was off to study Internal Medicine with emphasis in chest diseases. This resulted in his appointment to the Nova Scotia Sanatorium at Kentville and then in 1957 to Sydney as Medical Superintendant at the Point Edward Hospital. His quiet manner and competence in his field against the dreaded TB endeared him to many in these communities.

In 1960 he returned to Pictou and established a practice with his brother, Fraser, whilst serving on the active staffs of the Aberdeen Hospital, New Glasgow and the Sutherland Harris Memorial in Pictou as Internist.

Throughout these years he was active in a number of medical organizations including the Medical Society of Nova Scotia, the Canadian Medical Association and the American Thoracic Society. He became a Fellow of the American College of Chest Physicians and the Royal College of Physicians and Surgeons (Canada). He served terms as president of the Pictou County Medical Society, the Nova Scotia Branch of Internal Medicine, the Atlantic Branch of the Canadian Public Health Association, and the Nova Scotia Cardiovascular Society.

In 1982 he had the distinct pleasure of associating himself in practice with his son, Gordon, in Pictou. As well, at this time he was appointed Medical Director of the Munroe Wing for Extended Care at the Pictou Hospital — a 25 bed unit dedicated to special geriatric needs. His gentle manner and disposition made him especially close to his many geriatric patients.

"Dr. Clarence" was also active in many community affairs. He was especially active in the Pictou Rotary Club, and for many years played a stage role together with his singing wife, Doris, in their many annual musical productions. He was a man very comfortable with his religion, and was both an Elder and Steward of Pictou United Church. He was an avid sports fan and an active member of the Pictou Golf Club for many years.

Whether on the hospital wards, attending Church or Service Club meetings, or on the golf course, "Dr. Clarence" was ever the gentle, 'professional' man; maybe the last of an era, in his commitment to his family, his profession, his community and his God.

He leaves to mourn his loss his devoted wife, Doris (MacKay); son Gordon a third generation Pictou medical doctor; son Robert a Pictou school teacher married to Dr. Cathy Felderhof; and a daughter Joan a New Glasgow school teacher; together wth ten (10) grandchildren.

He will be greatly missed and fondly remembered by his legion of friends who caused his Pictou funeral to be the largest attended in several decades in Pictou town. A tribute to a true gentleman.

Dan Reid, M.D.

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OBITUARIES

Dr. A. Sterling Robbins, (56) of Lockeport, N.S. died on February 8, 1988. Born in P.E.I., he graduated from Dalhousie Medical School in 1956 and then went to Lockeport where he practised medicine for the past 3 years. He was a member of The Medical Society of Nova Scotia and the Canadian Medical Association. He is survived by a son and a daughter. The *Journal* extends sincere sympathy to his family.

Dr. Roderick A. Armstrong, (69) of New Glasgow, N.S. died on February 28, 1988. Born in India, he obtained his medical degree in London, England in 1946. He came to Nova Scotia in 1959 and was executive director of Digby Mental Health Centre and in the same capacity in New Glasgow from 1973 until retirement in 1981. He is survived by his wife and four sons. Sincere sympathy is extended to his family.

Dr. Ivan Carter, (48) of Halifax, N.S. died unexpectedly February 28, 1988. Born in England, he graduated from St. George's Hospital Medical School (London) in 1962. From 1966 to 1971 he worked in general practice in Caledonia, Ontario, and then trained in general and child psychiatry at McMaster University. He returned to England and spent a year as a consultant in Leicestershire, before being appointed as staff psychiatrist at the I.W. Killam Hospital in 1982. He was an excellent clinician and teacher and became an Associate Professor in psychiatry in 1987. Sincere sympathy to his wife, daughter and two sons.

Dr. Charles A. Gordon, (69) of Halifax, N.S. died on March 6, 1988. Born in Quebec, he graduated from Dalhousie Medical School in 1944 and then went on to specialize in internal medicine. He conducted his private medical practice in Halifax from 1951 until ill health forced his retirement in 1984. He was a member of The Medical Society of Nova Scotia and Assistant Professor of medicine at Dalhousie. He is survived by his wife, a son, and two daughters. The *Journal* extends sincere sympathy to his family.

Dr. John R. Kerr, (71) of Annapolis County, N.S. died March 12, 1988. Born in Cumberland County he graduated from Dalhousie Medical School in 1942. He started his medical practice in Annapolis Royal in 1946, retiring in 1984. He served as mayor of Annapolis Royal for over two terms and was a member of The Medical Society of Nova Scotia and the Canadian Medical Association. He is survived by his wife, two daughters and two sons. The Journal extends sincere sympathy to his wife and family.

Dr. John C. Acker, Sr. (89) of Lunenburg, N.S. died on March 15, 1988. Born in Lunenburg he received his medical degree from McGill University in 1923 and his specialty certificate in orthopaedic surgery in 1926. He practised in the Halifax area for 50 years and was orthopaedic specialist with the mobile clinic of the Nova Scotia Society for Crippled Children. He is survived by a daughter and a son, to whom, the Journal extends sincere sympathy.

Dr. R. Clarence Young, (70) of Pictou, N.S. died on March 6, 1988. Born in Millsville he graduated from Dalhousie Medical School in 1942. He started practising medicine in Pictou in 1960 and was Medical Director of the Extended Care Unit of Sutherland-Harris Memorial Hospital. He was a member of The Medical Society of Nova Scotia, the Canadian Medical Association and past president of the Pictou County Branch of the Medical Society. He is survived by his wife, a daughter and two sons, to whom, the *Journal* extends sincere sympathy. □

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