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Quality Assurance

"The ideal of independence requires resistance to the herd spirit now so wide spread for our worship of quantity and indifference to quality, to our unthinking devotion to organization, standardization, propaganda and advertising."

From ***Artistic Ideals 1927.*** *Daniel Gregory Mason.*

The newly installed President of The Medical Society of Nova Scotia, Dr. Bill Canham, recently stated in an interview in the *Medical Post,* speaking about accountability, peer review and quality assurance. "We have to be vigilant of the development of these new policies, and we have to be critical". He could also have added, that perhaps first we should understand the issues of quality and outcome measurement, as they take on increasing importance to us.

Dr. David Zitner's article in this issue, *What is Medical Quality Assurance?* provides a basis for understanding, and is really "essential" knowledge. He points out that government and administrators, as well as patients, are rightly demanding to know if their dollars are spent in a cost effective way.

Administrators are becoming increasingly aware of risk management as a way of decreasing litigation, insurance premiums, and perhaps of complaints from dissatisfied patients.

Also, the Royal College of Physicians and Surgeons and the College of Family Physicians are taking more seriously their responsibility to see that the quality of care given by their members remains acceptable. The College of Family Physicians has implemented a Maintenance of Certification examination given every five years, in order to maintain certification as well as to encourage continuing medical education. The Royal College of Physicians and Surgeons has also been looking at peer review and some insistence upon minimal continuing education within their membership.

Peer review, while related to quality assurance, is not the same. Peer review is really a form of credentialing conducted by physicians for physicians. The primary purpose of quality assurance, however, appears to be reduce inappropriate care and may be defined as "a measurement of health care activity and the outcome of that activity in order to identify whether the expected objectives of the activity are being achieved." Peer review, when extended to practices outside the hospital, can blend with quality assurance and an example of this is the paper in this issue on *Pneumococcal Vaccination Following Splenectomy.*

The College of Physicians and Surgeons of Ontario recently published, in *The Canadian Medical Association Journal,* a five year review of 918 office practices in Ontario and has recommended the continuation of peer assessment of office practices. In previous studies, carried out by the Ontario College, it has become evident, for example, that medical record keeping is a major problem for peer reviewed family doctor practices. The inadequacy revealed in these audits has attracted much attention in the lay press.

The College of Family Physicians has also been promoting research into the auditing of office practices of family doctors and it has an existing well-validated program which can be accessed at the request of members who wish the experience of having their office and office practice audited. Despite the activity in office practice auditing and suggestions of standards and guidelines for office practices, most quality assurance is still hospital based. In Nova Scotia, with the Department of Health and Fitness, the Provincial Medical Board and our own Medical Society showing new and enthusiastic interest, this may change rapidly.

The Canadian Council on Health Facilities Accreditation (CCHFA) has set accreditation standards and attempts to assess the quality of hospitals by assessing compliance to these standards. It is aware of the difficulty in truly measuring quality and outcome. The Council recognizes that the current system for monitoring quality solely through structures (e.g. medical and other audit committees) and processes (chart review and recommendations), is rapidly becoming inadequate and does not provide a scientific basis for drawing conclusions regarding the quality of a hospital. At present, they are directing large amounts of resources to determine valid methods of assessment in hospital care give by physicians.

The CCHFA Outcomes Project, a major effort by the Case Mix Research Group of Queen's University, explores the development of a cost effective and practical model for assessing outcome data and relating data to quality of care problems. A panel of physicians from across Canada, including physicians in Halifax and Dartmouth, will be used to establish the reference standard for the project, using a pre-established well validated review procedure developed by the Rand Co-operation of Santa Monica, California. The proposed model developed in this study may be used as a quality monitoring system that governing bodies, management and other staff will use for the good of our patients. Whether we like it or even understand it, unfortunately, may or may not be considered important.

One of the even more frightening aspects of this new interest in what we do has been the increasing awareness that we often don't know which treatments "pay off" for our own patients. Within our own ranks, physicians are questioning the scientific basis in many instances for such things as coronary artery bypass, endarterectomy, pacemaker implants, coronary angiography and upper gastrointestinal tract endoscopy. Certainly, in less technical areas, the scientific basis for the hundreds and thousands of useless office calls for upper respiratory infections might be difficult to justify. Somehow, the scientific method which we thought was the basis for our profession has escaped us and the proof regarding the outcomes of medical care just are not available. Our all too evident arrogance, as we criticize alternative methods of care, is becoming more than unpleasant and may be completely unjustified.

Assessment and accountability has been called "the third revolution of medical care" by Arnold Shelman in the *New England Journal of Medicine*. He states the first "era of expansion" was followed by the second "era of cost containment". This third "era of assessment and accountability" is now upon us. We have come a long way from the time when the Hippocratic oath was the only guarantee that we would provide the best quality care possible.

J.F.O'C.

GUEST EDITORIAL

Prevention of Infection after Splenectomy

Kevin R. Forward,* MD, FRCP(C)

The article by Szczesny and Schlech on the use of pneumococcal vaccination following splenectomy and the publicity associated with a fatal case of overwhelming post splenectomy infection (OPSI) in the province focus the attention of Nova Scotian physicians on the problem of fulminant infection complicating splenectomy.[1] Although surgeons once removed the spleen with impunity it is now recognized that splenectomy leaves patients with a significant life long reduction in their ability to fight infection. Splenectomy results in a number of immunologic defects including an impaired ability to produce immunoglobulins, reduced serum opsonic activity and reduced ability to clear particulate matter (ie. micro-organisms) from the circulation. The most frequently occurring infections in this setting are those due to encapsulated bacteria such a *Streptococcus pneumoniae, Haemophilus influenzae,* and *Neisseria meningitidis*.[2] Much less commonly unusual gram negative bacilli such as *Capnocytophaga canimorsus* (formerly DF-2) and *Babesia microttii,* a sporozoan parasite, are encountered.[2] Not only is the incidence of sepsis markedly increased but the mortality is alarmingly high even when patients present early enough to permit aggressive antibiotic and supportive therapy. How then should physicians intervene to prevent this devastating infectious syndrome?

First of all it would seem advisable to remove fewer

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spleens. Certainly this has been the trend in recent years both in the staging of Hodgkin's Disease and in the surgical management of spleens injured as a result of trauma or surgical mishap. When surgery on a damaged spleen is necessary surgeons are now much more likely to perform a reparative procedure which would permit partial or complete splenic preservation.

Streptococcus pneumoniae is the most frequent cause of post splenectomy sepsis and, since a significant proportion of blood culture isolates are of serotypes represented in the 23-valent pneumococcal vaccine all splenectomized patients should receive this vaccine. Since the antibody response to pneumococcal vaccine given after splenectomy may be reduced, whenever possible it is best to vaccinate at least two weeks prior to splenectomy. When this is not possible vaccinate when the patient has recovered from surgery; usually just before discharge.

Unfortunately many splenectomized patients are never immunized. Siddens *et al.* found that one third of splenectomized multi trauma patients received no vaccine.[2] In the same study fewer than half of patients who required splenectomy following accidental intra-abdominal trauma and only 11% of patients who had an incidental splenectomy received vaccine. Szeczesny and Schlech found that almost half of patients discharged from hospital had not been vaccinated and in only 13% were their family physicians aware of their vaccination status upon discharge from hospital.[1] Knowing that early revaccination may result in adverse reactions, family physicians may be reluctant to administer vaccine after discharge out of concern that the patient has had a previously undocumented dose. In the Szczney and Schlech study, family physicians vaccinated only seven patients although 27 patients had apparently been discharged from hospital not having received pneumococcal vaccine. This serves to emphasize that the vaccine status of each splenectomized patient should be well documented in the patient's chart and in the discharge summary. Although the first dose is probably the most important, recent recommendations suggest that revaccination of asplenic patients are strongly considered if they received the older 14-valent vaccine or if they received the 23-valent vaccine six or more years before.[4]

Although the incidence of *N. meningitidis* and *H. influenzae* sepsis is lower (15% and 12% of all cases), it may be reasonable to administer both of these vaccines to splenectomized patients however the value is unproven and the benefit is likely to be marginal. As with pneumococcal vaccine it is preferable to vaccinate at least two weeks before surgery as the anticipated antibody response is likely to be blunted.

The role of antibiotic prophylaxis in the prevention of post splenectomy sepsis is not clearly defined. A number of investigators have recommended the routine use of penicillin. They argue that both *S. pneumoniae* and *N. meningitidis* remain highly susceptible to penicillin and there is considerable anecdotal experience suggesting that penicillin prophylaxis is effective. Most infections occur with the first five years after splenectomy; unfortunately, this is longer than many patients will reliably take prophylactic antibiotics. Because the incidence of OPSI is higher in children and in patients whose spleens have been removed for reasons other than trauma, one approach would be to administer either intramuscular benzathine penicillin or oral phenoxymethyl penicillin to children and those at much higher risk of OPSI eg. patients with Hodgkin's disease, liver disease, sickle cell disease and thalassemia major.

The window of opportunity to treat infection in this setting is often very narrow as up to 60% of fatalities may occur in the first 24 hours.[5] Recognizing this, many physicians provide patients with an antibiotic such as amoxicillin with instructions to start taking it at the first sign of respiratory infection. Although it would be next to impossible to demonstrate the validity of this approach in a formal study it would appear to be a reasonable measure.

Patients whose spleens have been removed need to be educated about the risks of infection. They should understand that even an apparently trivial infection needs immediate attention, that infection may be rapidly fatal and that there should be no delay in seeking medical attention should they become unwell. Some authorities have gone as far as to recommend that splenectomized patients not own dogs because of the risks associated with dog bites (*C. canimorsus* sepsis). No doubt full knowledge of the risks will result in patient concerns and numerous false alarms but these are unavoidable.

These patients must inform any physician whom they may visit about their post-splenectomy status. They should know that dog and cat bites require immediate medical attention which may include administration of a prophylactic antibiotic such as amoxicillin/clavulanic acid. Such patients should know that if they travel outside Canada they may expose themselves to unusual infections like babesiosis or malaria both of which are more severe in patients without a spleen. They should carry a card and/or wear a Medic Alert® bracelet to remind both them and their physicians of their splenectomized state and its attendant risks.

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What is Medical Quality Assurance?

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The Nova Scotia Royal Commission on Health Care recommended an increased emphasis on quality assurance. Medical quality assurance is an effort to improve the efficiency and results of medical care.

Traditional methods of quality assurance examine the structures, processes and results of care. Outcome measures are necessary to focus the clinical review process. However, most modern clinical information systems do not allow hospitals to compare their results with other hospitals in the treatment of similar patients. A grouping system is described which allows hospitals to compare their results with those of other hospitals for patients with the same diagnosis and equivalent levels of disease severity.

Since health care institutions are being challenged to prove they provide value for money, the Nova Scotia Royal Commission on Health recommended an increased emphasis on quality assurance.[1] Before deciding to follow this important recommendation doctors and health care administrators must understand quality improvement methods and be able to answer, at least, the following questions. What are the goals of quality improvement methods? Why is it difficult to study the results of medical care? What methods are available to study the results of medical care?

GOALS OF QUALITY ASSURANCE

The goal of quality assurance programs is to improve the outcome of patient care by improving the processes of care. Agendas for quality assurance committees include the results of care and the processes which produced those results. Methodological problems make the evaluation of procedures and results complex. Assessing results is difficult since health outcomes depend not only on treatments but also on a patient's initial condition. Comparisons between institutions of the treatment of particular conditions must compare patients who are equally sick. Asthmatics and diabetics in one institution may be very different from asthmatics and diabetics in another institution. Also, quality assurance methods which concentrate only on the processes of care are not enough because for many treatments the relationship between the process and outcome of care is unclear.[2,3]

STRUCTURE, PROCESS AND OUTCOME

According to Donebedian's classic work, structures and processes of care dictate results.[4] *Structures of care* include not only the buildings but also the organization of people within an institution. For example, the organization of the medical staff and the workings of departments and committees. Defective structures produce defective results. Hospitals without a qualified obstetrician cannot expect to produce the best results for pregnant patients, even when each person on the hospital staff performs to the best of their ability. The absence of a qualified transfusion group will result in excess mortality from hemorrhage in emergency departments and from surgery.

Processes of care are the organization of events within an institution. For example, many processes are involved in the delivery of an appropriate drug to a patient. At least the following procedures must occur for patients to receive correct medications. First, an accurate diagnosis; second, appropriate transcription of medical orders; third, delivery of the prescription to pharmacy; fourth, delivery of the right medicine to the nursing floor; and fifth, delivery of the correct dosage to the correct patient. Where medication errors regularly occur, institutions are responsible for determining which processes require correction. Ideal procedures for delivering medication will prevent individual errors and produce better results. When many errors occur, it is useful to learn where the process of care was defective and to correct the process so errors become less frequent.

Unfortunately, hospitals today cannot assess whether their results are average, mediocre or superior in the treatment of particular conditions. Consequently, it is difficult to decide which processes to review. Information about overall results is necessary to focus institutional efforts at quality improvement.

When results are poor efforts are made to identify the structures and processes which permitted the unsatisfactory result. Similarly, when we identify organizations which have superior results we try to emulate their procedures.

Larger improvements in quality occur from improvements in average results. A greater improvement in overall quality occurs when the normal distribution is shifted. The detection and correction of aberrant individuals and incidents is necessary, but contributes less to overall hospital performance.[5] Objective methods must be available to tell where an institution fits on the continuum of results.

Measures of the overall results of care will also tell us what we are buying with health care dollars. Value is a function of price and product. A high cost does not necessarily mean bad value. Similarly, low cost does not imply good value. The ability to identify the results of care permits us to continue useful programs and

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improve or drop programs which contribute less to health outcomes. Flagging excellence allows us to copy the most useful procedures.

Unfortunately, no province in Canada has developed practical ways to measure the results of care. We should know how many years of extra life or comfort are obtained for our health care dollars. We should also be able to describe the best results that are obtainable for the treatment of any condition.

Quality care occurs when the results are equal to the best results attainable for a particular disease. Assessing quality therefore requires information about results for particular groups of patients compared with the results attained in other settings. Comparing results for diagnostic groups alone is not enough. Within a diagnostic class, patients have varying levels of disease severity. The results of health care are sensitive to the initial health of patients. We expect patients with severe asthma, uncontrolled diabetes and hypothyroidism to do worse than a group of patients with mild asthma alone. We expect diabetics with blood sugars of 7-8 mmol/L to do better than diabetics with blood sugars of 25-30 mmol/L. Therefore, comparisons must be between equally sick patients within a diagnostic group and patients with equivalent levels of comorbidity.

The ability to flag poor results enables institutions to devote resources to reviewing the processes which produced those results. Unfortunately, it is difficult, but not impossible, to produce meaningful comparisons of results. Why is it difficult to compare results?:

The American Health Care Financing Administration (HCFA) regularly publishes information comparing mortality rates between hospitals.[6] Unfortunately, raw event rates do not provide enough information to assess hospital quality.[7, 8] Hospitals may have higher death rates for a particular diagnosis for any of the following reasons:

1) Its patients are sicker
2) Its medical record coding practices are different
3) Its criteria for admission are different
4) Its clinical performance is different

The same factors influence other clinically pertinent rates. Hospitals in Nova Scotia do not yet have clinical information systems which provide pertinent outcome measures adjusted for severity. Today, we can compare lengths of stay for a particular diagnosis but cannot compare lengths of stay for patients who are equally ill. Length of stay information by diagnosis alone is not enough to make useful administrative judgements. In fact, without adjustments for disease severity, length of stay might not even be a useful flag for diagnoses and procedures which require review.

For most hospitals, the length of stay for some diagnoses is substantially shorter than Provincial or Canadian averages; for other diagnoses the average length of stay is longer. Longer average lengths of stay are associated with more complex disease. So, prolonged length of stay is complimentary because it means a department is caring for the sickest patients. On the other hand, those departments with shorter than average lengths of stay are delighted to note that short lengths of stay are associated with efficient practice. These services accept short length of stay as complimentary because it suggests that they are efficient. Clearly, length of stay alone cannot act as an indicator of performance. Moreover, length of stay information without data about the results of care is meaningless. A hospital which admits a patient twice for two ten-day stays for the treatment of a problem will appear to have a shorter average length of stay than a hospital which admits a comparable patient once for a 14 day visit.

Major improvements in institutional performance occur by improving the average levels of care. Small improvements by all members of a medical staff will produce a more noticeable improvement in overall institutional performance than changing the most aberrant member of a medical staff. Currently, it is not easy to flag for review those areas where the overall performance (measured by results) of an institution should improve.

HOW CAN INSTITUTIONS COMPARE RESULTS?

Physicians and administrators at Camp Hill Medical Centre are considering the use of the *Medical Illness Severity Grouping System* (medis) as the focus for an outcome based clinical information system.[9] The medis system abstracts objective data from charts and compares groups of patients with the same diagnosis and equal levels of disease severity. The system uses objective clinical signs and lab values to assign severity values to each patient. Institutions can then compare performance in the care of a particular disease with that of other institutions looking after equally ill patients with the same diagnosis.

Medisgroups also flags individual patients who develop complications or whose recovery time is substantially longer than that for other similar patients in the data base. Consequently, physicians can chose appropriate cases for review. Moreover, the system produces a one-page clinical summary for each patient so less medical staff and administrative time is required for the review process.

Quality improvement relies on measurement. We require measures of our own performance and we also must know how our results compare with the best results attainable. Fortunately, software programs are being developed which help administrators and clinicians flag areas of excellence and deficiency. □

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Quality Assurance and the Pathologist

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The practice of pathology, as with many other specialties and indeed our known world, are undergoing great changes. Many of these shifts are exciting and here, in Nova Scotia, we should consider this an opportunity to lead in some of these areas rather than to follow.

Pathologists are knowledge workers, who take raw laboratory data and translate them into clinically useful information for the physician. They are required to "integrate facts", i.e. laboratory tests, cytology, biopsies, etc. and integrate them with ideas — clinical findings and diagnoses — and produce timely, useful information to be used by the physician to the benefit of his or her patient.

With the Victoria General and Camp Hill Medical Centre Laboratories about to embark upon a joint Laboratory Information System purchase, it may be time to rethink some of the ways we handle our data and produce the necessary information.

LABORATORY USER GROUPS

Why not consider the formation of laboratory user groups, made up of non-laboratory physicians and patients who could work with a laboratory representative, in disseminating the best information where it will do the most good and still protect patient confidentiality? There is a great need for user participation in the service provision of the laboratory which heretofore has been ignored.

WORK TEAM MANAGEMENT

Why not develop management styles to include the work team management concept instead of directives above? The whole team should meet regularly, both with and without higher management, to discuss topics of relevance and make recommendations for improvement in operations, equipment selection, workplace design and everything else that affects the final product (useful patient care information). This type of approach may have been quite useful in selecting the appropriate computer system for the above mentioned laboratories.

When empowered to do a good job and make effective changes, the work team approach in other settings has been able to eliminate the necessity for large groups of middle managers, which may be one of the reasons why it is slow to develop in the hospital setting.

QUALITY ASSURANCE IN THE LAB

With the advent of modern technology (computers), it is possible for the pathologist to follow the ratios of work performed in relationship to the number of patients, which can be an indication of whether clinicians are over or under utilizing the laboratory. This can be done also on the basis of single tests performed, indicating patterns of individual physician's test ordering. With information such as this, the pathologist may be able to make constructive recommendations and possibly change ordering patterns, to benefit both the cost conscious and the test conscious.

In the United States, the College of American Pathologists is developing a laboratory management index program (LMIP) which helps laboratory physicians document the laboratory's overall operating performance and evaluates its performance against laboratories of similar size and scope of testing. Some of the components of LMIP's institution complexity score for designating peer groups include the use of institution type, laboratory complexity and the complexity of performed tests. A similar system, such as this, should be considered in this country, possibly administered by the Canadian Association of Pathologists (CAP). Going it alone, in a small province such as Nova Scotia, would be prohibitively expensive.

QUALITY ASSURANCE IN SURGICAL PATHOLOGY

Allocation of Tissue

In our modern medical world it is a more serious mistake to inadequately allocate tissue for ancillary studies, than to initially arrive at an incorrect histologic diagnosis. Tissue review and the consultation process are usually sought that will correct the initial diagnosis, but inappropriate tissue allocation is likely to be an uncorrectable problem without further surgical intervention.

Thus, the pathologist should be available for consultation prior to or during the procedure so that the proper tissue handling can take place. In commonly performed procedures, the pathologist, in conjunction with the physician or surgeon, should develop policies and procedures for the staff on proper handling techniques to lessen inadequate or inappropriate specimen allocation.

For example: lymph node, biopsy. In the past these lymph node excisions were immediately tossed into 10% formalin solution and sent to the laboratory. This is now considered inadequate handling. The lymph node should be sent in a fresh state, immediately to the laboratory, marked "attention, pathologist" so that the node may be divided and allocated properly into, not only formalin, but a separate fixative such as B-5. Touch preparations can be done at that time and small bits of

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tissue may be placed in gluderaldehyde for possible electron microscopy and small pieces may be frozen for immunofluorescent studies should the need arise.

Tissue Audit

Most hospitals have committees that audit all tissues removed during surgery, such as appendices, prostatic biopsies, etc. Acceptable standards for removal of normal tissues are set in some cases, such as appendix where it is considered that a preoperative diagnosis of acute appendicitis with a histologically normal appendix can be as high as 15%. Good documentation of other biopsies is difficult to obtain, particularly in endometrial biopsies as well as gastrointestinal biopsies. It is, at the present time, considered to be appropriate that a 10%-15% normal rate can be applied to all of these. These committees mainly look at the work of the surgeons. Where is the pathologist's peer review?

Referrals and Peer Review

Peer review of pathological diagnoses does take place in the case of malignant diagnoses, by the fact that almost all tissue with a malignant diagnosis is forwarded to the Cancer Foundation and is reviewed there by a designated Cancer Foundation pathologist. Unfortunately, as some diagnoses are a matter of opinion or of academic disagreement, I suggest that it would be more appropriate, particularly in cases where there is a difference of opinion between the reviewer and the primary pathologist, that a panel of pathologists, designated by the Cancer Foundation, be set up to review and make a group decision, which would also then be included in the followup report to the primary pathologist. This is done in all cases of referral to the Canadian Tumour Reference Centre in Ottawa. The initial referral report by the first reviewer would still take place in order to expedite treatment. The panel would mainly act as an arbitration forum.

THE AUTOPSY AS A QUALITY ASSURANCE DEVICE

The hospital autopsy has fallen into some disfavour with clinicians in the last few years, since accreditation standards no longer include the autopsy in their requirements. Autopsy rates in hospitals are somewhat variable and in my hospital, in particular, it is quite low. This may be due to circumstances other than those listed below such as recent expansion of the laboratory include a fulltime pathologist only this year and the large number of deaths of unknown cause which are usually reported to the medical examiner's office.

Autopsy as a Quality Assurance Device

1. Monitors treatment results.
2. Aids physicians concerned about unusual presentation of disease.
3. Correlates clinical diagnosis with post-mortem diagnosis.
4. Identifies correct cause of death for statistical purposes.
5. Monitors disease prevalence.
6. Informs the family regarding familial/inherited diseases for useful preventive measures.
7. Provides tissues for research and teaching to improve the quality of care.
8. Can be used in outcome studies.
9. A necessity in the training of future pathologists.

The Autopsy has had Diminished Usefulness in Clinician's Eyes for Several Reasons

1. Hospital accreditation no longer requires a certain percentage of autopsies to maintain accreditation.
2. High technology, medical diagnostic procedures such as NMR, CAT scans, endoscopies and nuclear medicine studies, have replaced the need for autopsies in the minds of many clinicians.
3. Autopsies may show that the death of the patient was not caused by the condition being treated for and thus open up litigation concerns.

The pathologist's response to the second item is that in many reviews, comparing clinical diagnoses with autopsy results, there is up to a 30% error rate. New technology has not yet eliminated the need for the autopsy. The pathologist's response to the third item is that there has been little indication that autopsy results have been used more than other medical information on litigation proceedings. Also, medicine is imperfect and oversights as well as errors are made, in spite of all our sophisticated technology. The autopsy can help us learn from those mistakes.

MEDICAL/LEGAL AUTOPSIES

The hospital pathologist should be involved in the formation of hospital policies regarding reporting of deaths to the medical examiner's office. In some instances the policies have not been reviewed for years, and in other cases the policies are vague and not helpful for the physician trying to determine which cases are reportable and which are not. For example, Dartmouth General Hospital's policy includes reporting deaths occurring in the surgical suite. Deaths in this situation are usually not considered to be medical examiner's cases as no foul play is suspected. It would be better if permission from the family was requested and a careful hospital autopsy was performed, so that the information could be available during death review and made available to the physicians who were involved in the treatment of the patient, in a timely and useful manner.

CLINICAL PATHOLOGY AND QUALITY ASSURANCE

Clinical pathology in most general hospitals, includes clinical chemistry, haematology, microbiology and blood banking. There are vast instances in which the pathologist may be involved in the assurance of quality medical care information to the physician in each of

these subsections. The approach can be different in different hospitals. Prospective and retrospective audits may be performed and be presented to the appropriate clinical appraisal committee in the hospital. Such studies can include the use of single unit transfusions in blood bank, the use of manual differential counts in normal CBCs in haematology, the application of clinical relevant testing in microbiology.

The pathologist is also deeply involved in the selection of laboratory equipment, the introduction of new on sight testing and assuring the specificity and accuracy of the present profile of testing in his or her own laboratory.

It is also a requirement of the pathologist to arbitrate the ordering of necessary and unnecessary after hours testing as well as type and number of referred out work that cannot be performed on sight.

CONCLUSION

The laboratory was one of the first areas in the hospital to develop methods for assurance of a quality product to physicians. The pathologists in your hospital should be there to act as resource persons regarding all things pertinent to the provision of timely, accurate and useful patient care information. That is the hallmark of a good laboratory. Much still needs to be done in the areas of laboratory management, community involvement and pathology peer review, but it can be accomplished without acrimony and distrust if cooperation is the prime directive within the section of laboratory medicine, the receivers (patients) and the users (physicians) of our laboratories. □

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WHAT IS MEDICAL QUALITY ASSURANCE?

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Multifactorial etiology is the last resort of the intellectually destitute.

Samuel Shuster, MBBS, FRCP (Lond)

Methods to Measure and Improve Hospital Performance

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Patients and payers want institutions to strive for improvement and assure that treatment is proper. Unfortunately, current information systems do not allow doctors or administrators to measure overall results. Hospitals are unable to compare their results with those of other hospitals for equally ill patients with the same diagnosis. Consequently, proxy methods have been developed to assure proper treatment and improve performance.

Doctors at Camp Hill Medical Centre have enjoyed using a variety of methods to improve the quality of care which they provide and they are delighted to share the methods and results with other health care institutions. Quality is free since it is cheaper to do things right the first time than to repair errors.

How can physicians improve performance without global methods to measure results?

While medical care competes with other government programs for funding, demonstrating the appropriateness of medical attention will help maintain support for those systems which provide useful care. Without meaningful outcome measurements, alternative methods are used to identify unacceptable processes or results.

If health care institutions could demonstrate superb results, review of the structures and processes of care would not be required. A hospital with a zero mortality rate and short lengths of stay which cared for people with serious illness would not require many reviews of hospital procedures. Unfortunately, we cannot measure overall results easily so that other methods are used to assess the quality of care.

SENTINEL EVENTS VS. RATE BASED INDICATORS[1]

Industrial quality assurance methods depend on outcome standards against which an organization can compare itself.[2] How many automobiles are produced? What is the life expectancy of the steering mechanisms? What is the defect rate of a factory's output? How often are workers injured? Graphs can depict the frequency of specific events. When events are below an accepted rate it is less important to review the processes which produced the result. Institutions with control charts can concentrate on areas in which improvement is clearly possible and necessary.

Fortunately for physicians and administrators, health care institutions produce results other than improved patient health. (Fortunate because sophisticated methods have not been developed to measure improvements in health). We believe that these other results are closely related to patient health.

Hospitals can generate rate information for indicators which contribute to institutional performance. Examples of rate based indicators are rates of hospital acquired infections, patient fall rates, surgical complication rates, returns to the operating room within 48 hours of surgery, returns to hospital within 7 or 14 days of discharge. Ideally, the rate for these indicators is 0%. However, for rate based indicators it is almost impossible to achieve 0% rates. For rate based indicators control graphs can be generated.[3] When rates are above an acceptable value the organization must examine its procedures; otherwise the organization can safely use its time and resources to examine and improve other areas of care.

Institutions continually try to improve mortality rates. However, while the rates are below the upper control rate, an institution may feel comfortable focusing quality improvement efforts in another direction.

On the other hand, "A sentinel event flags a serious, undesirable, and often avoidable process or outcome".[4] Sentinel events should never occur, and 0% is the only acceptable standard. Sentinel events are signals for a careful review of the processes which produced the event, and each occurrence requires thorough analysis.

The following blended case exemplifies a sentinel process and outcome. The case shows how a single event can produce a useful examination of the processes of care and lead to improved procedures.

A 46 year old man was treated at a teaching hospital. Over the course of a long weekend, he complained several times to various housestaff that he was short of breath and felt that he was going to die. Housestaff documented oedema of the knee but each time different housestaff believed that his condition, although serious, had not really changed from the condition reported by the previous intern. Finally, the man went to an emergency department where he was told he was ineligible for care there because he was already an inpatient. The man returned to his room and died 4 hours later. Neither the floor nurses, the housestaff involved, the emergency department nurses, the emergency department physician, nor his roommates had tried to contact the active staffperson who was ultimately responsible for the patient's care and outcome. The doctor responsible only learned of the difficulties after his patient had died. Moreover, other patients in the ward realized their neighbour was very seriously ill and

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possibly dying. Doctors and nurses appeared to be unaware of the severity of the patient's conditions.

Subsequent review found that a digoxin level had been done and that the patient's level was not in the therapeutic range. There was no institutional response to the inadequate drug therapy, although the patient had signs of congestive failure. Housestaff had documented signs of congestive failure but none had acted on the information.

Procedural Problems in this case

If an intern believed a patient would survive the day or night they did not devote substantial time to the patient. The housestaff responsible for continuing treatment could perform a more detailed analysis the next day.

The following were results of the case which were clearly unacceptable:

1. Patient dissatisfaction without an obvious institutional response. Staff ultimately responsible for patient care and well being were not informed of this man's marked dissatisfaction with care. The patient remained short of breath and dissatisfied with his care. The patient's doctor was not notified that the patient had gone to the emergency department.
2. Death, possibly preventable.
3. A pertinent abnormal laboratory result was ignored. Normally, the preceding events would generate a response from the active staff person caring for this patient.

Unfortunately, a mechanism to alert the staffperson of these events was not in place and the patient's physician did not learn of the events until after the patient died. No effort was made to contact the responsible physician when the patient wandered to the emergency department.

A structural problem existed since discussions with housestaff showed that some residents were overworked. Competing responsibilities could prevent sufficient attention to a patient's care.

Four procedural changes decrease the chance of a similar event happening. First, requiring a signature that an abnormal report has been reviewed before filing, reduces the likelihood that significant reports will be ignored. Second, procedures are developed to assure that when a patient is not satisfied with care, a more senior physician and finally the active staff person or his designate is always called. Third, develop procedures to assure that competing responsibilities of housestaff do not interfere with adequate performance of those duties. Fourth, assure that hospital workers know whom to call whenever competing responsibilities prevent adequate attention to a patient's problem.

ORGANIZATION OF MEDICAL QUALITY ASSURANCE

The Medical Quality Assurance Program at Camp Hill Medical Centre is successful because it is truly a peer review program. Physicians review the care provided in their own speciality. Departments and committees of the Medical Advisory Committee (MAC) use a variety of methods ranging from informal audits to comprehensive publishable research studies.[4] Each Medical Department is responsible for quality assurance within its own area. Committees of the MAC and administrative committees review procedures which cross departmental boundaries. A highly qualified and enthusiastic medical records staff provide necessary and valuable support for case reviews and information about overall performance. Administrative support for medical quality assurance allows clinicians to contribute their unique expertise while highly qualified non-medical technical staff review specific charts, procedures, and results for compliance with physician and administratively generated standards.

COMPONENTS OF MEDICAL QUALITY ASSURANCE

Physicians at Camp Hill Medical Centre, through the medical advisory committee, agreed that quality assurance was part of the ongoing responsibility of each medical department. Each department agreed to assume the following minimum responsibility for quality improvement and peer review:

Regular Departmental Meetings

Peer Chart Review

a) random chart review
b) specific chart review-sentinel event review
   i. Mortality review
   ii. Morbidity review-charts flagged by medical records because of specific events which might have been indicators of inappropriate care. Examples include single unit blood transfusions, patients unexpectedly admitted to the Intensive Care Units, patients unexpectedly readmitted to hospital within 15 days of discharge.
   iii. Tissue review where indicated. An example would be review of charts where a normal appendix was removed.

Evidence from the Rand Corporation suggests that interater reliability for medical record review may be low.[5] Best use of physician time occurs when doctors who review charts answer professional questions such as the following:

1. Was the outcome of care appropriate?
2. Was the outcome predictable and consistent with the history, physical and laboratory work obtained at the time of admission?
3. Were selected medical processes appropriate?
4. Were complications avoidable? If so, how?

These questions are examples of the types of

questions doctors can answer to help determine if the processes of care are optimum.

Medical records technical staff are able to give effective reports on the structure of medical charts. For example, did physicians include documentation required by the medical records committee. How many days does it take to reply to a consult request? Are responses made to abnormal lab results? Medical records staff can also answer questions about medical charts for the purpose of medical audit and research.

Medical Audit

Generally, an audit reviews the processes of care. Each department completes at least two audits yearly. Smaller divisions of large departments have agreed to participate in at least one review each year.

Audit topics are chosen for any of the following reasons:

1. Rate based indicators suggest a problem — for example increased infection rates
2. A sentinel event suggests a procedural problem may exist-for example surgery on the wrong organ or administration of an innapropriate medication
3. The topic is of interest to the department
4. A belief exists that a process may be inappropriate — for example are drugs given on a timely basis?

The medical component of the audit process includes the following steps.

1. Choosing a topic
2. Define screening criteria for chart review by medical staff *or* medical records staff. Medical records staff are more efficient than medical staff for many parts of chart review. They know the structure of a chart and can easily find pertinent information (when it is legible). However, medical staff must provide objective definitions of items for medical records review.
3. Review the results.
4. Review individual aberrant charts.
5. Where results are poor, medical staff develop procedures to improve the results.
6. Repeat the study if necessary.

RESULTS

Every medical department at Camp Hill Medical Centre completes regular quality assurance studies. The following are examples of processes and outcomes which have been reviewed. Space prevents a detailed listing of all the studies but each department has reviewed important topics.

The medical records committee noticed that late arriving reports could be filed on the chart of a discharged patient without physician review. Consequently, important abnormalities could be ignored. The process was changed. All late arriving reports now require a physician signature before filing. Therefore, late arriving abnormal reports cannot be ignored.[6]

Diagnostic imaging regularly compares its detection rates with confirmed pathology reports, to assure that important findings are detected and to assure physicians that detection rates are excellent. A 1988 study of general interest to the medical community is that only 52% of patients who had a barium enema also had a sigmoidoscopic or rectal exam in the previous three months.

Gynecology compared several protocols for treating PID and recommended a protocol which is equally effective but about five times less expensive than two other conventional treatments.[8]

The Department of Medicine documented the effectiveness of programs for diabetic education.[9]

Outpatient care is usually less expensive than inpatient. The urology department documented that out patient basket extraction of lower ureteric stones is a safe procedure with acceptable outcomes.[10]

The Emergency Department developed mechanisms to assure that thrombolytic therapy for myocardial infarction is delivered on a timely basis.[11]

Utilization reviews examined the proportion of days that patients received unique hospital services on particular wards.[12] The method helps to identify groups of patients who can receive less expensive outpatient care.

The Medical Quality Assurance Committee found that average length of stay was shorter for those patients where the history and physical was cosigned, compared with those patients whose admitting history and physical examination were not cosigned.[13]

Medical staff are enthusiastic about the medical quality assurance program. The following are the results of a questionnaire which was sent to medical staff about the medical quality assurance program at Camp Hill Medical Centre.[14]

a) 81% of physicians reported that their department made important changes to policies/procedures in the previous year.
b) 91% said that their own department had carried out quality assurance studies which the respondent found interesting.
c) 87% answered "yes" to the question "Are the quality assurance reporting requirements appropriate?" Quality assurance programs do not place on onerous burdens on medical departments.
d) 96% would like to be able to compare their own clinical outcomes with those of other institutions in the treatment of equally ill patients with the same diagnosis.

Quality assurance programs improve the processes and outcomes of care. Quality is free. It is cheaper to do things right the first time than to repair errors. The questionnaire results suggest that medical staff is enthusiastic about opportunities to improve clinical performance.

Quality assurance programs are useful to medical staff

because it allows them to improve the processes of care and obtain better results. Quality assurance programs are useful to administrators because they can document and quantify the usefulness of the health programs under their control. Quality assurance programs are useful to patients because they improve the effectiveness and efficiency of care. Quality assurance programs are useful to taxpayers because they can reduce the overall cost of care.

Health care institutions which follow the Royal Commission recommendation to emphasize quality assurance will provide better care at lower cost. □

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Euthanasia, Assisted Suicide and The Elderly

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O, let him pass! He hates him that would upon the rack of this tough world stretch him out longer.

***(Shakespeare,* King Lear)**

The cover story of the March 19, 1990 issue of *Time* was titled "Love and let die" and dealt with "helping" death along. A poll commissioned by Time/CNN showed that 80% of those surveyed stated that decisions about ending the lives of terminally ill patients who cannot decide for themselves should be made by their families and doctors rather than lawmakers; 81% felt that a living will instructing the withdrawal of life-sustaining treatment should be respected; and 57% stated that in such cases it would be "all right" for doctors to administer lethal injections or provide lethal pills.

More recently the case of Janet Adkins has attracted great interest. Adkins, a 54 year old Portland, Oregan schoolteacher, was suffering from the early stages of Alzheimer's. She was not that impaired (June 18, 1990 issues of *Time* and *Newsweek)* — for example, she beat her 32 year old son in a tennis match the week before her death. It was dread of the future which drove her to suicide. There is evidence that she was a long-standing proponent of the right-to-die movement. Before the onset of her illness she had joined the Hemlock Society. Early this year she contacted Dr. Jack Kevorkian who had developed and publicized a "suicide machine." She and her husband flew to Michigan and met with him. Kevorkian is a retired pathologist noted for certain extreme positions such as advocating the use of death-row prisoners in medical experiments. Kevorkian confirmed the diagnosis of Alzheimer's and judged her lucid. He agreed to assist Ms. Adkins in suicide. The location of the assisted suicide was Kevorkian's 1968 Volkswagen van. They drove to a public park which had electrical outlets for campers. Kevorkian set up an IV with saline. Adkins then pushed a red button which started an infusion of a pain killer then one of potassium chloride. Kevorkian after confirming her death called the police.

The June 30, 1990 issue of the *Globe and Mail* contained an extensive Focus piece on euthanasia titled "For mercy's sake." It described a Daniel Goodman (not real name) who decided to kill himself with the aid of his family. At the age of 67 he determined that he could not abide the changes a leg fracture would impose on his lifestyle. Things went dreadfully wrong and he had to be literally strangled by his son and wife with a plastic bag. In the article it is stated that the swelling interest in euthanasia is motivated by two factors — the increased technical capacity of medicine to prolong people's lives (and their death) and the advent of AIDS, the final stages of which are so unpleasant that many sufferers seek to avoid them. Shortly afterward an AIDS worker from Vancouver publically admitted to assisting AIDS victims in committing suicide.

The above cases raise major questions about euthanasia and assisted suicide. Are they allowable? If so, how should they be done and controlled? What are the appropriate roles for patients, families, physicians, other health care workers, and the courts? While a general societal issue, I believe that euthanasia and assisted suicide are topics of great importance to the elderly and their care-givers. Death usually occurs in the elderly subgroup of our population. Quantitatively death is focused in the older members of Canadian society. The burden of disease and dysfunction is greater in the elderly than in younger adults. When concerns are raised about an individual's quality of life as justification for euthanasia, this again relates in the majority of cases to the elderly. A number of writers have argued that age is a useful criterion for rationing health care. Can this be supported? Finally cognitive impairment from conditions such as Alzheimer's is found preferentially in the elderly. This complicates the decision-making process immensely and leads to a situation of great potential abuse.

In this paper I wish to explore the following specific issues — nutritional support for demented residents of long-term care facilities and cardiopulmonary resuscitation in the elderly. These provide "case-specific" foci for discussing some of the problematic areas raised by the definitions, ethical principles, assessment of competency, and the legal situation in Canada as it relates to euthanasia and assisted suicide. It is important to point out that the morality and legality of an act are two distinct yet entwined attributes. A law is a rule of conduct prescribed by a properly constituted governing authority and enforced by sanctions.[1] The morality of an act depends upon whether it can be supported by reasons within the framework of a set of moral assumptions which themselves must be subject to critical appraisal.[1] The two are connected as most people feel the legality of an act has a bearing on its morality and when sufficient numbers believe in the

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morality of an act then law(s) may be modified to make it "legal." At the outset I want to emphasize that I'm not a lawyer or a philosopher. I'm a practising specialist in geriatric medicine. All my comments must be interpreted critically in view of my limitations, which are obvious, and my biases, which are not so obvious even to myself.

DEFINITIONS

Person: To vitalists where there is human life the sanctity of life principle forbids its taking.[2] Many qualify this position — for example, holding that life is constituted of two fundamental factors other than biological existence, namely: (A) a capacity for consciousness of self; and, (B) a capacity to experience something other than pain and suffering.[2] It should be pointed out that to define someone as a "non-person" has historically been used as justification for considering him/her outside the law and thereby refusing him/her the basic protections which the law grants all human beings.[3] The simplist definition for "person" would be anyone born of human parents.

Competence: Competency is a legal term used to describe a person's capacity to understand and act reasonably.[1] To be competent a person must be sufficiently mature to have settled value commitments and priorities, have a normal capacity to understand the situation and the likely effects of the proposed interventions, have the ability to evaluate the desirability of various likely futures in relation to the pursuit of personal goals and value commitments, and be able to make and communicate a choice arising from these considerations.[5]

Active euthanasia: The term is derived from the Greek words *eu* (well) and *thanatos* (death). It refers to the deliberate intervention to bring about the death of another human being.[7] For many the term "euthanasia" refers solely to this.[3]

Passive euthanasia: "Letting die" involves omitting the steps necessary to prolong life. The distinction between active and passive euthanasia is viewed as crucial by most physicians with passive but not active being perceived as acceptable.[1] Some argue that "being allowed to die" condems an individual to a slow, painful process whereas a lethal injection, for example, would by comparison be quick and painless.[1] It is also pointed out that the withholding of treatment can be viewed as the intentional termination of the life of one human being by another — in other words, active euthanasia. People can become equally dead by acts of omission as well as commission. If we *intend* their death it can be brought about as well by omitted acts as by those we commit.[6]

Notwithstanding the above many physicians feel the distinction has both logical and a social validity. To deny the distinction between active and passive is to guilty of a conceit — imparting more power to physicians than we actually have. Modern health care does not have the capacity to postpone death indefinitely and we are frequently futile in our efforts to even temporarily do so. Second, there is a difference between physical (performing the "act") and moral (having the "intent") culpability. Finally the distinction is important in the practice of medicine — it protects the historical role of the physician as one who tries to cure or comfort patients, not actively kill them.[6] We muddy the differentiation between the two at our peril.

Voluntary/involuntary euthanasia: Voluntary euthanasia involves explicit consent by the patient; involuntary involves a decision for death by a person or persons other than the patient.[1]

Physician-assisted suicide: Here the physician aids, abets, or counsels a person to commit suicide but the final act is performed by the patient.[7] It has been stated that some lives are not worth living because of, for example, uncontrolled pain. Supporters of assisted suicide feel that the decision as to when and how to die deserves the respect and even assistance of others because it is the ultimate exercise in self-determination.[6] In the article by Wanzer *et al.*, 10 of the 12 distinguished authors stated that they "believe that it is not immoral for a physician to assist in the rational suicide of a terminally ill person."[8] But if one views life as the most fundamental right then suicide can be stated to be the ultimate self-contradiction.[6] Sometimes to safeguard essential rights it becomes necessary be prevent or curtail other rights. Removal of the sanction against assisted suicide for those terminally ill may lead to an expansion of the right to kill to groups of individuals were it would be inappropriate because of societal factors such as the psychological vulnerability of certain groups (e.g., the elderly) who may be pressured to opt for assisted suicide; the perceived crisis in health care costs with the resultant search for measures to decrease expenditures; the legal doctrine of "substituted judgement" — this "right" cannot only be restricted to those mentally competent and would be presumably offered as an option to those mentally incompetent with the decision being made by their surrogate; and, the expanded definition of terminal illness — for example the Hemlock Society would include sufferers of Alzheimer's.[6]

Death with dignity: There is no precise definition of this concept but it usually refers to an attempt to eliminate from the process of dying the dehumanizing aspects sometimes imposed on it by the abusive or massive use of medical technology coupled with a greater insistence for patients to have direct participation in the decision-making process regarding their medical treatment.[3]

Terminal illness: A situation where a patient has reached the stage where administration of therapeutic care has become medically useless to bring about eventual recovery or even effective control of the disease.[9]

Ordinary and extraordinary means: This is no longer felt to be a useful distinction. What is "ordinary" or "extraordinary" is specific to the particular circumstances of each case.

Quality of life: This is a subjective assessment of the

worth or value of an existence. This is a dangerous area for physicians. Dr. Christophe Hufeland wrote nearly two hundred years ago: "If the physician presumes to take into consideration in his work whether a life has value or not, the consequences are boundless, and the physician becomes the most dangerous man in the state."[3]

LEGAL ISSUES

In Canada active euthanasia and assisted suicide are both illegal while suicide is legal.[7] The provisions of the Canadian Criminal Code on the subject of homicide appear to adhere to a vitalist view of human life.[10] Homicide occurs with the death of the victim. Canadian law does not take into account the motive of the person who commits the homicide. Many feel that making active euthanasia or assisted suicide legal would lead to a "slippery slope" in which the practice would be extended to those less willing but deemed undesirable by society.

Passive euthanasia is felt to be legally permisable in Canada. Our courts are felt likely to accept the right of a patient to refuse medical treatment and the right of family members on behalf of the incompetent to do the same. In these cases the lack of treatment accelerates the dying process but death is caused by the original illness or injury. Physicians have never been prosecuted if they stop, or fail to start, medical treatments — even procedures such as feeding — if they only delay inevitable death.[7,11] It must be recognized that Canadian courts have not considered in any depth the issues dealing with the right to die.[2,7,11] At present in Canada there is no right to die, in a strict legal sense. In particular there have been no cases dealing with whether an incompetent person has the right exercised through a guardian of refusing continued medical treatment. Section 197 of the Criminal Code imposes a legal duty on certain persons (e.g., parents, guardian, spouse) to provide the requirements of life for those dependent on them. Courts have interpreted this provision as being applicable to physicians who neglect or refuse to provide a person with medical care, assuming that all other conditions of the offence are also met, and, in particular, that the person is incapable of taking care of herself/himself. Sections 198 and 199 state that practitioners must use "reasonable" knowledge, skill, and care in the provision of medical and surgical care which must be continued if an omission to do so would be dangerous to life. The word "reasonable" leaves a great deal of discretion to the evaluation of the particular circumstances by the physician of the individual case and must be interpreted in this light.[7]

Numerous American cases have been heard on these issues but, while legally instructive, they are not compelling in the Canadian setting. The Canadian Charter of Rights and Freedoms have also made the area more problematic. Section 7 of the Charter guarantees an individual the right to life, liberty, and security of the person. Arguably security of the person includes a right to refuse unwanted medical treatment.[2] In Canada there is no legislation specifically authorizing guardians to refuse medical treatment on behalf of individuals. However, Canadian Courts do have jurisdiction which is theoretically unlimited and gives Courts the power to protect persons who, by reason of incapacity, cannot exercise any judgement in order to serve their own best interests.

Many feel there is a legal void in Canada into which lawyers, judges, and the courts should enter. Judicial review, particularly for cases involving those incompetent, is favoured by them because it is stated that: (A) only through judicial review can a person's substituted judgement be exercised in a completely impartial and objective manner; (B) jucidial decision-making based on precedent is ideally principled, as cases will be decided with reasoned judgements based on established principles; and (C) the judicial process is a public one, and judges' actions are subject to scrutiny.[2]

I'm admittedly not sanguine about routinely shifting the burden of decision-making to the courts. Even members of the American judiciary lament the American situation and the "ultra-legalistic maze we have created."[12] I personally favour the exercise of competent clinical judgement in the context of mutual decision-making by the physician and the patient (or surrogate) as informed partners. A number of problems occur when medical decision-making is routinely brought into the courtroom such as — timeliness, cost, communication difficulties (the vocabulary of medicine and law are quite different), inappropriate attempt to obtain judicial "blessing" for decisions already agreed upon, different modes of decision-making (the law strives for certainity while medicine accommodates itself to dealing with uncertainity), tendency to temporize (opt for the status quo), and the adverse effect of publicity on these emotional and private issues.[12]

ETHICAL CONUNDRUMS

There is wide-spread agreement that ultimately patients or their families acting for them must be involved in all life-and-death decisions.[13] Many state categorically that the decision BELONGS solely to the patient or his/her surrogate.[13] Exactly what role physicians should have in the process is currently being vigorously debated. There is wide-spread support for shared decision-making between the physician and the patient (or surrogate). But do you have to strive for consensus above all else? What do you do if this can't be obtained? Patient wishes should, I believe, have primacy.[13]

There is a growing sense within the American medical community that it is permissable for physicians to judge whether a treatment is futile and are then entitled to withhold it if so determined.[14] Consent from the patient is not, it is felt, required. One very real problem is the definition of futility — for example, is it treatment that offers no reasonable hope of benefit, treatment that only prolongs dying, or treatment that in

the opinion of the physicians' reasonable judgement is futile?[15] Patient advocates state that patient preferences about the goals of therapy are an essential component of the clinical determination of futility.[15]

Do health care providers have their own rights? Can they be forced to go against their own belief structure in the provision of health care? No one should be forced to undertake activities they view as reprehensible. How to balance the potential clashes of patient and care-provider rights will test the mettle of our society.[5]

AGE AS A BASIS FOR RATIONING HEALTH CARE

An important book by Daniel Callahan argues that a disproportionate share of health-care resources are spent on extending the lives of the elderly with little thought of their quality of life and competing health-care needs.[16] As a result the entire health care system's financial stability is being threatened without even serving the needs of the elderly. He recommends shifting attention from life-extending to relief of suffering. Once an individual has reached their "natural life span" he/she would not be eligible for life-prolonging modalities of care. The determination of how long the "natural life span" is was left open. This would essentially condem an entire class of people to passive euthanasia.

Most studies bearing on the issue of health care rationing based on age suggest that by and large aging in itself is a relatively benign process — its the concommittent disease state(s) and other factors which lead to the "bad" prognosis frequently found in the elderly. To quote: age should not be "referred to as a medical criterion (for limiting treatment) . . . the medical liabilities commonly associated with old age, and not age itself . . . (these are) the true reasons for exclusion."[17] It must also be recognized that we frequently know little about the effectiveness and risks of many procedures utilized in the care of our elderly patients.

There is an interesting dichotomy between what physicians frequently say ("limit") and what they actually do (investigate and treat intensively).[10] An empirical study by Redelmeier *et al.* found that physicians make different decisions when evaluating an individual patient than when considering a group of comparable patients.[20] For the individual, physicians are more likely to order an additional test, spend time directly assessing the patient, avoid raising troubling issues, and recommend a therapy with a high chance for success but associated with a chance in turn for adverse consequences. Physicians appear to give more weight to personal concerns of the patient when dealing with an individual. There is a distinction between "statistical lives" and "identified lives" with higher priority given to the life of an identified person.

COMPETENCY

As long as a patient does nothing strange and agrees to treatment recommended by the medical profession, questions of competency do not arise. These questions frequently first arise when patients refuse treatment and choose a course of action which, in the opinion of the physician, threatens their welfare.[10] The medical issues generated by mental incapacity center around the task of obtaining consent for a suggested treatment. The standards for disclosure of benefits/risks does not rest on competency but the approach of the physician will vary depending on the question of competency. If the patient is incapable of comprehending the nature and the consequences of the proposed procedure, the anticipated risks and benefits as well as the existence of alternative remedies, substitute or surrogate consent must be obtained or at least an attempt must be made to do so. The legal standards of competence include the four related skills of communicating a choice, understanding relevant information, appreciating the current situation and its consequences, and manipulating information rationally.[20] If there is doubt about the capacity of a person, the attending physician would do well to obtain the opinion of a second physician, preferably a psychiatrist. When doubts remain, the consent of a substitute decision-maker should be obtained as well as the patient. Most determinations of decision-making capacity never reach the courts — nor should they. This is not an exact science — there is an urgent need to try to develop more objective and effective means of assessing decision-making capacity especially in medically ill patients.[21]

In Nova Scotia there is an Incompetent Persons Act which defines incompetency as being unable to manage his/her affairs because of infirmity of the mind.[4] Only a judge can declare a person incompetent and appoint a guardian. Physicians can declare people incompetent but he/she cannot appoint a guardian. A guardian is a substitute decision-maker appointed by a judge. There are two types of guardian, guardian of the person and guardian of the estate. Guardian of the person is responsible for making decisions, for example, about personal care, where the person lives, and the provision of general welfare. The process of appointing a guardian takes about six weeks.[4]

Frequently the affairs of an "incompetent person" are looked after informally by a spouse, child or other relative. Although this is not illegal, problems may arise if there is substantial property or financial assets requiring management. Joint bank accounts are a way to enable someone to simply and cheaply look after another person's financial affairs. A Powers of Attorney can be arranged which authorizes a person to act on your behalf *but* you must be mentally competent at the time it is granted. An Enduring Powers of Attorney contain a clause which allows the Power to remain in force even if you become incompetent. The legal consensus in Canada is that the powers of a Powers of Attorney are limited to property/estate and not the person. You can also choose in advance who can give consent to medical treatment on your behalf if you become unable to consent.[22] The appointment must be

in writing and must be signed by the person. The signature must be witnessed — the witness should not be the individual being appointed to act in behalf of the person. Living wills have no binding legal effect in Nova Scotia or any other Canadian province, however they do provide a strong statement of the person's wishes.

There is a growing sense that competency has numerous facets.[23] There are many different "competencies" that as adults we are typically assumed to have — e.g., driving a car, looking after our finances, determining where we should live. Some advocate a sliding-scale model for deciding on competency with competency standards rising as the consequences flowing from the decision become more serious. The "least restrictive alternative" is a principle held by many which requires that decisions made on behalf of an incompetent person promote as much personal autonomy as possible.[21]

CARDIO-PULMONARY RESUSCITATION IN THE ELDERLY

For approximately 20 years cardiopulmonary resuscitation has been widely available in North American hospitals and selected long-term care facilities. Success defined as leaving the hospital alive has varied from 0 to 30%.[24] Probability of success is influenced by patient characteristics and treatment settings. There is a consensus that this modality of treatment is inappropriate for certain categories of patients. Some have questioned the appropriateness of cardiopulmonary resuscitation for the elderly.

A retrospective chart review of five Boston health care institutions examined the outcome of 503 consecutive patients aged 70 years of age or greater who received cardiopulmonary resuscitation.[24] Of the 503, 112 (22%) survived initially but only 19 (3.8%) survived to hospital discharge. Nine survived with little or no impairment and two were severely debilitated (one in a vegetative state and the other severely demented). Eight were discharged home. Only 2 of 244 patients with an out-of-hospital arrest survived hospitalization while 17 of 259 in-hospital arrests survived to discharge. Markers of an increased likelihood of death include unwitnessed arrests, terminal arrythmias (asystole and electromechanical dissociation), and cardiopulmonary resuscitation lasting more than 15 minutes. The researchers concluded that cardiopulmonary arrest is rarely effective for elderly patients who suffer an arrest out-of-hospital, unwitnessed, or associated with asystole or electromechanical dissociation. An accompanying editorial pleaded for the need to establish meaningful guidelines for do-not-resuscitate orders and the need for frank and open discussion.[25]

Taffet *et al.* reported on a review of 399 cardiopulmonary resuscitation (CPR) efforts in 329 veterans.[26] Witnessed arrests were more frequently initially successful than unwitnessed arrests (47.7% versus 29.9%). Of the 77 CPR efforts in patients 70 years of age or greater, 24 (31%) were initially successful with 22 (92%) being alive after 24 hours. None lived to discharge. Markers of a poor outcome were as follows — presence of sepsis, cancer, increased age, increased number of medication doses administered, and absence of a witness. It was recommended that CPR should be limited only to those who have the greatest potential benefit. A series of commentaries in the same issue gave a variety of responses to the study.[27,28,29] Murphy argued in favour of physicians making unilateral decisions to withhold resuscitation because: (A) physicians are not required to provide or discuss useless therapy with patients; (B) resuscitation is rarely effective, and in many cases futile, in this population; (C) most patients in LTC facilities do not want resuscitation; (D) ethical perspectives suggest that resuscitation need not be obligatorily offered in this setting; and (E) recent court cases support the withholding of useless therapy.[27] Youngner took exception to the proposal viewing it as a regressive step — physicians would substitute their own value judgement for those of the patients and it would cut off communication.[28] Schiedermayer stated that age per se should not preclude patients from receiving CPR by a unilateral assessment of futility by a physician.[29]

A conflicting empirical study was performed by Tresch *et al.*[30] Elderly (more than 70) and younger patients who were successfully resuscitated and hospitalized following out-of-hospital arrests were examined to determine if there were differences in outcomes. Hospital deaths were more common in the elderly (71% versus 53%) but other outcomes (length of hospitalization, stay in ICU, number of neurological deaths, number with residual neurological impairment, requirement for placement in a long-term care facility, one-year survival). They concluded that CPR for out-of-hospital arrests in the elderly is reasonable and appropriate. An accompanying editorial pointed out some of the limitations of the study in particular that there was no mention of the group who were not initially successfully resuscitated — did they have a similar age distribution?[31]

A few additional studies were reviewed. Applebaum *et al.* looked at the results of CPR when performed in nursing homes.[32] Only 2 of 117 patients survived the hospital admission — 102 (89%) were DOA, 2 died within 24 hours, 11 died while in hospital (ALOS 5 days), and 2 survived both of whom were dead within the year. Bayer *et al.* studied the results of CPR on an acute geriatric unit. 14 (15%) were alive 3 months after hospital discharge.[33] They advocated selective use of CPR within acute geriatric units.

Fischer addressed the issue of do-not-resuscitate (DNR) orders in long-term care facilities.[35] The outcome of CPR is related to the selection of patients and age itself is not a critical factor. Most residents in long-term care settings would not be appropriate for CPR because of their underlying medical status and the nature of the facility. DNR in many ways is a tangential issue in long-term care settings. Faculties should focus on the determination and provision of appropriate care to

elderly residents. An editorial by Solomon bemoaned the irrational stance of many Americans in supporting the indiscriminate use of CPR.[35] He strongly favoured the proposal to eliminate the presumption that CPR be attempted in nursing homes unless declared otherwise.

The law in Canada appears to hold that a physician needs to make a responsible medical judgement based on generally accepted clinical criteria, consult the patient or surrogate, and then may write a "do-not-resuscitate" (DNR) order on the chart.[10] The order must be disregarded by another physician or a nurse if the clinical picture changes between the time it was written and the time it must be carried out. There are two inherent legal risks that may face a physician — allegation of medical negligence or a charge under the Criminal Code of criminal negligence causing death.[36] Physicians could defend themselves by demonstrating that they acted in conformity with accepted practice.

FORGOING LIFE-SUSTAINING FOOD AND WATER FOR AN ELDERLY RESIDENT IN A LONG-TERM CARE FACILITY

A not infrequent problem encountered in long-term care settings is the case of an older, demented patient who has an inadequate oral intake. The prevalence of protein-calorie undernutrition in nursing homes is 30-60%.[37]

There are a number of medical techniques for providing food and water to patients unable to maintain adequate nutrition and hydartion orally — hypodermoclysis, proctoclysis, intravenous, total parenteral nutrition (TPN), naso-gastric tube, and gastrostomy tube.[5] When the gut is available for nutrition it is generally cheaper and often more effective than enteral modalities. These modalities can be problematic because of a variety of difficulties such as the following — are poorly tolerated, provide inadequate nutrition, high cost, invasive form of therapy, and have modality-specific side-effects (hypodermoclysis-infection, inflammation, anasarca; proctoclysis-rectal irritation; intravenous-hard to maintain; TPN-infection, require close monitoring; ng tube-pneumonia, enteral irritation, restraints, require functioning GI tract; gastrostomy tube — initial surgery or endoscopy, require functioning GI tract).

Aside from other considerations the giving of food and fluid has great symbolic significence.[5] It symbolizes caring and regard for the patient. While legal precedences and ethical opinions indicate that the provision of fluid and nutrition is not always legally or morally required, there is still great ambivalence about the withholding of this treatment modality. Of reassurance is empirical evidence from hospice programs that indicate that patients not receiving adequate hydration and nutrition can remain quite comfortable with good nursing care including frequent mouth care.[5]

Choices made for incompetent individuals should be the choices that the person would have made.[5] The "subjective" standard for determining this is when the patient's preferences are known precisely and accurately. When this is not available, one should assume that the person would have pursued his/her best interests. The "pure-objective" standard is when the patient's preferences are completely unknown and others must make the determination of what is in the person's best interest. The middle position is called "limited-objective" which is where some things are known about the person's preferences but not enough to definitely determine the course of care.

What are the possible outcomes in this situation? Early death from either dehydration or from a complication of the medical procedure aimed at maintaining nutrition. The person may live longer but a diminished quality of life. Finally the person could be restored to the same or even better health. Treatment choices stated simply are "supportive" care in anticipation of death which could lead to wrongful abbreviation of life; deciding to evaluate for a treatible cause for the deterioration with nutritional support during this — it should be decided at the onset that artificial feeding is a time-limited intervention; or provide nutritional support irrespective of any other consideration. No option is always right.[5] Decision-making should in my opinion be shared between the patient (or her/his surrogate if the person is deemed incompetent) and the physician with input from other care-givers.

There appears to be a growing medical-ethical and legal consensus in North America for permitting the withdrawal of fluid and nutrients from patients in various circumstances such as the following for example.[38] There is currently a lack of consensus for those who are mentally incompetent. Some warn of the "judicial fiction" of determining what is in the person's best interest which may be used to justify decisions which will lead to the death of vulnerable people.[38]

CONCLUSIONS

What to make of all this? While much is agreed upon and relatively straightforward, much is not. Conclusions are tentative and frequently personal. I will try to give my perspective on some of the issues reviewed above.

The case of Janet Adkins cannot be held up as a sterling example even by proponents for assisted suicide. Was she competent? Was her desire clearly and consistently expressed? Where there other "treatment" options available for her which were neglected like counselling or treatment of a depression? Was the diagnosis certain? Why wasn't a "second opinion" requested? Similar arguments can be made about Daniel Goodman. Turning a blind eye to the issues of euthanasia and assisted suicide will potentially permit more abuses. I feel the Canadian Medical Association should take a leading role in advancing the national debate about these troubling issues.

Personally I believe there is a distinction between active and passive euthanasia. I cannot agree with active euthanasia essentially for the reasons eloquently reviewed by Peter Singer and Mark Seigler.[39] I agree with

passive euthanasia though this is not an excuse to neglect the patient. Personally I also cannot agree with assisted suicide though I recognize the swirling debate about the issue. This is an area where the greater good (preservation of life) may well require a curtailment of or infringement on the rights of another.

For better or worse this is an area where the lawmakers and courts will become more active. While clearer direction is required, I fear the indiscriminate imposition of the legal process on this area.

More objective standards for the assessment of competency must be striven for though this may prove as elusive a goal as the Holy Grail. Advanced directives should become more prevalent and when present should be respected. Again speaking personally I have no desire to have my biological life extended if my biographical one has come to an end.

I do not believe that health care should be rationed based on chronological age. This is potentially an area of great abuse. I agree with Norman Levinsky who wrote — ". . . we should allocate resources according to the probability that a patient will benefit rather than his or her age."[10] This is also consistent with my thoughts about CPR and invasive measures to support nutrition/hydration. Each case should be evaluated for the relative benefits and harm. This assessment should be done by the patient (or surrogate) and his/her physician conjointly. In most cases a resolution acceptable to all parties can be reached — if not the wishes of the patient (or surrogate) should in my opinion prevail. Within the limits of the Canadian Medical Association Code of Ethics, physicians should not be compelled to provide a form of treatment which he/she feels is morally wrong.

We face no simple solutions. The debate about euthanasia and assisted suicide may well prove as divisive as the one about abortion. As members of a respected professional group we should not shirk our responsibility to both personally and as a group address euthanasia and assisted suicide. □

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Pneumococcal Vaccination Following Splenectomy

A FIVE YEAR EXPERIENCE AT THE VICTORIA GENERAL HOSPITAL

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The most common cause of community-acquired bacterial pneumonia is *Streptococcus pneumoniae.* Pneumococcal vaccine is currently recommended for patients with several chronic illnesses, the elderly, and for post-splenectomy patients. Functional or anatomical asplenia appears to be one of the absolute indications for pneumococcal immunization. Pneumococcal disease of all kinds is unusually common in such patients[1,2] and can be associated with fulminant over-whelming septicemia with disseminated intravascular coagulation.[3] When elective splenectomy is being considered the vaccine should be given at least two weeks before the operation to ensure an adequate antibody response.

To determine the immunization rates for pneumococcal vaccine in splenectomized patients, we decided to review patients undergoing splenectomy at a large acute care general hospital (800 beds) providing primary, secondary and tertiary care to the Maritime provinces.

METHODS

Medical records of patients undergoing splenectomy at Victoria General Hospital in Halifax, Nova Scotia for the years 1981-1985 were reviewed. To determine the awareness of family doctors of the patients pneumococcal vaccination status, a questionnaire was sent asking whether the family doctor had knowledge of the patients immunization status.

To determine the knowledge base of physicians concerning the vaccine a second questionnaire was sent, consisting of three sets of questions:

1) Demographic questions about the physicians age, sex, training, size of practice, and years in practice.
2) Vaccine questions covering the frequency of office stocking and use of different vaccines.
3) Knowledge based questions covering the indications for pneumococcal vaccine use.

RESULTS

From 1981-1985, 197 patients underwent splenectomy at the V.G.H. From there, 29 who died following surgery and 18 who had no recorded family physicians were excluded.

Of the remaining 150 patients, 76 (52%) were immunized at the V.G.H. according to their medical records. None received the vaccine earlier than two days prior to surgery. Immunization rates were significantly higher ($p=0.001$) in 1984 and 1985 than 1981-1983, suggesting greater physician awareness of indications for immunization (Table I).

TABLE I

PNEUMOCOCCAL IMMUNIZATION POST-SPLENECTOMY
Victoria General Hospital, 1981-1985

YEAR	#DOCUMENTED	#NOT DOCUMENTED
1981	9	21
1982	13	17
1983	14	13
1984	16	13
1985	25	5
TOTAL	76	70

Chi square for trend, $p < 0.001$

From the first questionnaire, 93 responses were received (62%). Physicians of 11 patients (13%) were aware of the immunization in the hospital. Physicians of 32 patients (38%) were unaware that the patient had been immunized and physicians of 27 patients (32%) were unaware that vaccination had not been given. Seven of the patients were immunized by the family doctor. The remaining 16 patients could not be located.

From the second questionnaire 17 responses were received. Four of the physicians (24%) said they stocked pneumococcal vaccine in the office, compared with 14 (85%) who stocked influenza vaccine, which is recommended for use in similar groups of patients.

COMMENTS

Streptococcus pneumoniae infections occur in all age groups and are most severe in those over 65 years old. Mortality from pneumococcal disease is higher in the elderly and patients with underlying medical conditions such as lymphoma, multiple myeloma, cirrhosis of liver, hepatitis, alcoholism, renal failure, nephrotic syndrome, chronic pulmonary and cardiac disease, functional or anatomical asplenia, organ transplant and CSF leakage. The development of antibiotic therapy has not reduced the mortality from pneumococcal bacteremia.

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A pneumococcal vaccine had been developed in 1917, introduced for the first time in 1940 and was reintroduced for use in 1977. After its reintroduction, discussion has centered on whether the vaccine was effective in preventing pneumococcal disease. Some trials were inconclusive[4-7] and cases of clear vaccine failure have been reported.[8,9,12] All of this raised doubts among physicians about the vaccine efficacy and possible harmful effects.

The efficacy of pneumococcal vaccine reaches 90% in young immunologically healthy populations with high incidence of pneumococcal disease.[10,11] Efficacy in North American populations with lower infection rates has been more difficult to determine and in most studies has been around 60%.[13,14,15]

A 23-valent polysaccharide vaccine is currently in use, with antigens representing serotypes of *Streptococcus pneumoniae* responsible for over 87% of pneumococcal infections. On the basis of most recent studies, efficacy of the vaccine is estimated to be 70%.[16] The duration of the protection is unknown, but elevation of antibody titers has been shown 5 years[17] and 10 years[18] after immunization in more than 50% of vaccinees who initially developed a significant rise in antibody levels.

Our results suggest that pneumococcal vaccine is underutilized in patients undergoing splenectomy and that documentation of immunization is poorly transmitted to family physicians. However, correlation with the year of splenectomy suggests that there is an increasing awareness of physicians in hospital settings of the indications for pneumococcal immunization.

The second questionnaire responses suggest that underutilization of pneumococcal vaccine is not only due to poor communication with family physicians, but also due to an incomplete knowledge about vaccine indications among family physicians, Unfortunately our data are not sufficient to determine the factors which influence the family physicians' awareness of the vaccine, such as type of practice, age etc. It appears however that continuous efforts are needed to ensure that this important public measure is utilized in the province of Nova Scotia, particularly for patients at very high risk for invasive pneumococcal disease. □

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Doctors, Dollars and Deficits

A LONG-TERM PERSPECTIVE

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This article describes long-run factors underlying the substantial shift in treatment accorded physicians. The relatively rapid growth in numbers of physicians and in physicians per capita in recent decades is reviewed, as is the relationship between growth in numbers of physicians and growth in expenditures on physicians service. The effect of chronic deficit financing by Canada's federal and (most) provincial governments in shaping the policy responses considered by Royal Commissioners and provincial governments is also discussed. It appears that the number of physicians in Canada will continue to increase at a relatively rapid rate in the immediate future.

Canada's latest round of provincial Royal Commission reports on health systems seem preoccupied with identifying the root causes of relatively high growth in expenditures on physicians services. These reports explore a greater range of possible policy responses, and give serious consideration to more drastic changes in the financing and delivery of physicians services, than previous reports. Why?

The following commentary offers one observer's view of certain long-run factors underlying the substantial shift in treatment accorded physicians. Three themes developed are: first, the relatively rapid growth in numbers of physicians and in physicians per capita in recent decades; second, the relationship between growth in numbers of physicians and growth in expenditures on physicians services; and third, the effect of chronic deficit financing by Canada's federal and (most) provincial governments in shaping the policy responses considered by Royal Commissioners and provincial governments confronted with the prospect that the number of physicians in Canada will continue to increase at a relatively rapid rate in the immediate future.

Changes in the tone and content of recent Royal Commission reports, and in attitudes of governments regarding the necessity of change within their health care system, it seems to this observer, have relatively little to do with recent substantive changes within these health care systems — including the role of doctors and technological change — and much to do with the persistent growth in numbers of physicians per capita and the gradually deteriorating fiscal realities confronting governments.

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DOCTORS

Over the past twenty-five years the number of physicians in Canada (excluding interns and residents) has grown at slightly more than 2% compounded annually. This is not a high rate of growth in itself but it is about double the annual rate of growth of Canada's population. Consequently the ratio of population per active civilian physician in Canada has gradually fallen from about 850:1 in 1970 to 550:1 in 1987, and is projected to fall to about 400:1 by year 2006 and to continue falling thereafter.

The 1964 Hall Commission which preceded the implementation of universal, comprehensive, portable, publicly financed medical care insurance in Canada foresaw the need for more physicians per capita. It recommended expansion of Canada's medical schools, and graduates increased by 69% from 1016 in 1968 to 1714 by 1977. However, no one foresaw, first, the large influx of foreign trained physicians to Canada beginning in the mid-1960s which continued to the mid-1970s, when revisions to Canada's Immigration Act reduced the number of immigrant physicians from well over 1,000 to about 400 annually, or second, reduced attrition due to lower emigration rates. Consequently the growth rate of physicians in Canada since the mid-1960s substantially exceeded expectations. Canada's population grew less rapidly than expected over this same period. Hence population: physician ratios fell much faster than anticipated. Meanwhile the number of physicians trained in Canadian medical schools continues at levels recommended by the Hall Royal Commission in 1964.

The 'market' for physicians in Canada is national rather than provincial in scope (excepting perhaps French-speaking physicians in Québec). All provincial medical licensing boards recognize the Licentiate of the Medical Council of Canada (LMCC) for purposes of granting a licence to practise medicine. This facilitates inter-provincial mobility by physicians, serving the interests of both physicians and patients. But absence of barriers to inter-provincial mobility means that the primary determinant of the rate of growth of physicians in each province is the Canadian rate of growth of physicians.

The rate of growth of physicians in Canada is jointly determined by the ten provincial governments, which fund undergraduate enrolment in Canada's 16 medical schools and post-graduate internship and residency programs, and the federal and provincial governments, which together influence the number of foreign trained physicians admitted to Canada annually. Attrition due

to deaths and retirement from practice is highly predictable in aggregate. Emigration of physicians from Canada is unpredictable, but in recent years has been stable and of about the same order of magnitude as immigration of physicians to Canada.

Given these conditions, each province and the federal government rightly perceive that, acting alone, they are incapable of substantially reducing the rate of growth of physicians in Canada, that the short-run political costs of doing so may be high, and that the long-run financial benefits of doing so cannot be captured by any government which acts alone, but will be distributed across all ten provinces. Hence Canada's national paralysis in responding to an era of growing physician supply, or "oversupply" according to some observers, which has been documented in physician manpower planning reports for at least a decade.

DOLLARS

The correlation between growth in numbers of physicians and growth in expenditures on physicians services is very high, when analysis is done at a high level of aggregation and over long periods of time. This is not surprising in the context of Canada's tax-financed medical care insurance system which, in pursuit of equity goals, has eliminated direct user fees to patients, and which relies on private practice physicians to deliver insured services on a fee-for-service basis. Holding fee schedules and the mix of services constant, total expenditures for insured physician services increase proportionately with the number of services provided/utilized, which increases with the total number of hours worked by all physicians, which increases with the number of licensed full-time-equivalent practitioners in Canada.

Similar relationships between rates of increase in total expenditures and numbers of practitioners are found when analysis is conducted at a 'micro' level, e.g., where the unit of observation is an individual practitioner, or specialty group. But here correlations are lower and less stable due to the relatively greater importance at this level of analysis of other institutional, professional, personal and demographic factors which co-determine practice size and practice profiles.

The relationship between total expenditures and numbers of practitioners is further complicated when fees change. There is considerable evidence that changes in the relative value of fees paid for different types of services induce changes in volumes of services in the expected direction. But this is rarely an important determinant of changes in total expenditures for physician services.

More controversial and problematic is evidence of a systematic short-run inverse relationship between changes in the index of fees paid for all physician services (in constant dollars) and changes in the total number of services provided. The margin of error involved in predicting the size and timing of short-run changes in volumes of physician services following negotiated adjustments to fee indexes severely limits the capacity of provincial departments of health/treasury boards to control the rate of growth in total expenditures on physician services by limiting fee increases.

DEFICITS

Negligible growth in Canadian real per capita incomes during the 1980s, little prospect of much better economic performance in the 1990s, recurring annual federal and provincial deficits, deteriorating credit ratings at home and abroad, increased total interest costs on accumulated national and provincial public debts (which now account for up to 40 per cent of Federal revenues), and perceived limits to voter tolerance of new or higher taxes — have eroded the fiscal and political freedom to manoeuvre by Canada's federal and provincial governments.

A new fiscal reality has emerged. This is causing governments to do nasty things to each other, to their programs and to their voter/citizens. Senior governments unilaterally reduce revenue and cost-sharing commitments to junior governments, invade tax fields previously reserved for lower levels of government, raise tax rates, hike fees for all manner of licences and services provided by federal, provincial and municipal governments — in order to reduce their annual deficits by raising revenues. On the expenditure side, fiscal constraint objectives — expressed as reduced target rates of growth of public expenditures per capita in constant dollars — now receive more than lip service. New fiscal realities force tougher public revenue and expenditure decisions.

Health care expenditures, by virtue of size alone, have spawned shelves of Royal Commission reports cataloguing ways and means of moderating health expenditure growth rates, while searching for new ways to get the biggest health-outcome bang for the buck. Within these reports doctors receive much attention, reflecting their roles as providers of publicly funded medical services, as gatekeepers for publicly funded hospital, pharmaceutical, and miscellaneous health and social service benefits, and as recipients of about one-fifth of total health care expenditures.

DISCUSSION

Over the past two decades, the number of physicians in Canada has increased steadily and relatively rapidly while the fiscal capacity of governments has gradually deteriorated. This has put upward pressure on total expenditures for insured physician services, downward pressure of physician earnings, and has forced provincial governments to explore new and more effective ways of controlling growth in expenditures on physician services in particular, and government spending in general.

With currently very little provincial control over the growth of physicians within their jurisdictions, and

twenty years of experience which cast doubt on the effectiveness of tough fee negotiations as a means of controlling increases in total expenditures, provincial governments and Royal Commissions are pressed to consider new, more controversial, means of controlling total expenditures on physician services.

The catalogue of alternative control mechanisms is familiar to physicians. Included are various ways to limit entry to practice in a province, e.g., by selectively modifying licensing requirements, or by restricting new licensees to specific geographic areas within a province. Following successful legal challenges to such initiatives, attempts to restrict the issuance of new "medicare billing numbers" have been tried, and challenged. Whether future revisions to provincial regulations governing the licensing and medicare billing rights to new physicians will meet legal challenges to unknown, but this is clearly the most direct way for provinces to increase control over the number of physicians and total physician expenditures in their jurisdiction.

An alternative strategy, which avoids the pitfalls of controlling the total supply of physicians and reaps the health benefits associated with having more practising physicians, would limit global expenditures on physician services to a predetermined maximum. If that maximum is exceeded, various formulae have been proposed for distributing the burden of adjustment among providers, usually by means of some ex-post fee adjustments.

Other avenues explored more seriously in recent reports include proposals to de-insure selected medical services judged either clinically ineffective or nonessential. The "all or nothing" nature of the Canada Health Act regarding co-payments by users of insured services inhibits experiments involving "partially de-insuring" certain classes of presently insured medical services, e.g., based on available evidence of clinical effectiveness and expected contribution to improved health status. Mounting fiscal pressures may open the way for consideration of alternative insurance coverage giving varying degrees of public coverage for different classes of services. Not far removed are proposals to govern the spread of "new medical technology", thereby indirectly rationing the supply and availability of associated medical services.

Virtually all Royal Commission reports recommend experimentation with alternatives to fee-for-services modes of remuneration for physicians services, with alternative modes of delivering medical care, and with ways of providing substitutes for physician services using less costly health professionals. More recently, though, are a series of recommendations designed to govern the expansion of specialty services within community hospitals. These include a more selective granting of hospital privileges to new specialists and increased control of hospital expenditures in support of new specialty services not consistent with the role approved for a given hospital. These measures are designed to constrain the growth of direct expenditures on specialist services, and the indirect expenditures by hospitals in support of more specialty services.

The foregoing illustrates the types of policy options explored in recent Royal Commissions on health, commissioned by provinces across Canada. Viewed in an historical context the latest round of Royal Commission reports encompass a broader, and more controversial, set of policy options than found in earlier reports. One interpretation of this development is that it reflects the cumulative frustrations experienced by provincial governments — since the start of universal, comprehensive, and zero-copayment medical care insurance plans twenty years ago — in trying to gain more control over the rate of growth of expenditures on physician services within a volume driven fee-for-service system. These frustrations are rooted in the limited control which individual provinces have been able to exercise over growth in the volumes of insured medical services provided within their borders, and the realization that control over fee adjustments is only partially effective in limiting growth in total expenditures.

The range of policy responses available to provincial governments in dealing with fiscal pressures associated with increasing numbers of physicians is limited by many factors, including: Canada's division of federal and provincial responsibilities; societal choices made in the 1950s and 1960s concerning the structure of Canada's universal and comprehensive public health insurance system; conditions governing federal-provincial cost-sharing agreements; legal rights and freedoms of individuals; and public opinion regarding future directions of Canada's health care system, as reflected in briefs to Royal Commissions on health by numerous consumer, business and professional groups. The recent willingness of provincial governments to publicly consider certain policy options previously judged to be unacceptable suggests that new fiscal realities demand tougher policy responses.

In the United States, which also experienced high growth in number of physicians and much pressure to constrain the rate of growth in health system costs, policy responses reflect the predominantly market-oriented nature of the U.S. health care system. Ironically, these market-oriented responses have included considerable "corporatization" of U.S. medicine, with attendant declines in professional and clinical freedom so valued by independent private practice physicians. In contrast, policy responses within Canada's publicly financed health care system have so far had relatively little effect on the professional and clinical freedom of independent practitioners.

What changes lie ahead during the 1990s?

The number of Canadian physicians and physicians per capita will continue to grow in the 1990s, first, because there is as yet no evidence of a collective political will to enact major changes, and second, because even if action is taken quickly the length of undergraduate and graduate medical education is such that the full impact

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Lifeboat Ethics and Medicare*

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Two months before my own medical school graduation in 1969, Canada launched its most popular social program in history. That program was Medicare, a health care insurance plan which boasted comprehensiveness, universality, accessibility and portability. Twenty years later, that same program, after several course changes to avoid disaster, has run into trouble of Titanic proportions. The Canadian population has hit the tip of the iceberg and much of the damage is still unknown. However, the signs are clear; the ship is sinking.

Currently, in the United States, because medical costs are increasing and patients cannot afford to pay, there appears to be a groundswell of interest in launching a similar program. However, the lessons to be learned from the neighbors to the North may prevent the inception of a similar disaster.

In a government-funded medicare system, there is no "green screen" to restrict the type or extent of care permitted by the contents of the patient's wallet. Essentially, where they reside and the facilities in the geographic area, as well as the demand for these available services, will dictate what care the individual receives. In our egocentric society we do not have any guidelines for medical care allocation, such as the old customs of "women and children first" or "the captain goes down with the ship."

It has been said that one of the self-evident truths of economics is that once a service becomes or is at least perceived to be free, demand expands to infinity. This is amply illustrated by the sky-rocketing costs of the medicare system in Canada which have escalated from $7 billion in 1970 to $39 billion in 1985, with 1989 projections of an astronomical $46 billion in a country with a population of 26 million. This has left the Canadian federal and provincial governments scrambling to find ways to limit these exploding costs.

Some of the factors which contribute to health care costs include: an increasing population, an aging population, the so-called AIDS epidemic, ballooning public expectations and demands, and increasing technology in medicine.

Medical technology, with its effects not only on the health care dollar but also on how medicine is practised today, bears some discussion. There are several major effects of this technology. First, committing funds to "high tech" medicine prevents us from using them in other areas of social policy that may have more influence on health. Second, private firms develop new technology and promote it in order to make a profit. The philosophical question of long-term benefit is usually not considered; neither is the supposed advantage of the newer, more expensive approach questioned. Finally, patients tend to feel that a doctor who orders more tests with newer equipment is being more thorough, whereas more skillful physicians rely on less testing.

As medical costs increase, the result is a vicious cycle of increasing reliance on the government to pay the bills for those who cannot afford to do so for themselves. Since governments, too, say that they cannot afford the increasing costs, the only solution is rationing of health care services. The *Medical Post* (June 13, 1989) defined rationing as "being unable to provide all the care expected to be beneficial to all patients."

The political view of the situation revolves around one over-riding belief: medicare is immensely popular with the electorate and a politician who has to be constantly concerned about the outcome of the next election to secure his/her career, is unlikely to make decisions which could be unpopular with the voters.

As one of the biggest discretionary items in a government's budget, health care offers a tempting target to politicians who are also worried about electoral repercussions from the massive deficits that they and their predecessors have incurred and who are sniffing around for easy ways to cut costs. As health care also involves largely invisible services that voters do not miss until they need them, the temptation or cut-backs can easily become irresistible.

Thus, at present, there is no evident plan, either on a philosophical or on a pragmatic level, for what reasonable measures of services can and will be provided. Political actions have indicated that the politicians would dearly like to abdicate their responsibility and place the burden of unpopular decision squarely on the shoulders of the physicians. There is a false but deeply entrenched perception that doctors have been profiting from the infirmity of others or are, at least, "ripping off" the public treasury by topping up their incomes.

The patient's view of medical care insurance is based on a fear of disease and death, with the mistaken idea that health care is totally responsible for their well-being and this belief has led, in no small way, to the development of expensive treatment systems. The ensuing dependence on "quick-fix" medicine, fuelled by fee-for-service, and the dependence of doctors on their laboratory tests, prescription pads and operative procedures, has resulted in less emphasis on the art of medicine than has been practised in the past, and the

*Based on a paper presented at the Interstate Post-Graduate Medical Association Meeting, San Diego, California, December, 1989.

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medicalization of a number of social problems such as loneliness, unhappiness, job dissatisfaction and relationship and family breakdown. These issues become especially acute as patients age and the breakdown of their social and family support systems becomes even more critical.

Medicare is generally viewed by the patient as a free service that allows access to the newest of the technological marvels which are housed in hospitals that have become modern temples. Patients clearly expect that the physician will use these to their benefit. There are four paradoxes that result from this level of expectation on the part of the patient. First as a consumer, the individual wants access to all that modern medicine has to offer, but as a taxpayer he/she is not willing to pay the price so that this same level of service will be available to all. Next, there is an expectation that the government and the health care system will provide consistently high quality care despite irresponsible behaviour in the management of an individual's personal health. This encompasses such things as smoking, alcohol consumption, imprudent dietary habits and lack of exercise. In addition, in an attempt to ensure that resources are accessible to individuals, there is a trend toward increasing centralization of care and concommitent control of the allocation of resources. Finally, the components of the system that offer the greatest potential as agents of change, namely the public, the professionals and the government, frequently act as the strongest resistors of that change.

The physician's view of the health care insurance scheme is generally that it can result in too much government interference in the practice of medicine. Positioned at the interface between the system and the patient, the physician is forced into restricting the floodgates of access to the health care system. This role as controller will jeopardize the trust between physician and patient.

The medical profession, however, is not without culpability for the woes of the health care system. On the micro level, it is very difficult for an individual physician to consider the effect of a single doctor-patient encounter on the total economic costs, and there is a deeply held belief among members of the profession that a patient's fate should never be decided on economic grounds anyway. We forget that all the destructive floods in history were caused by collections of individual drops of water. The medical profession, in its self-protective stance, feels that it is not responsible for the increasing health care costs and is, therefore, blameless of any ensuing rationing. This simply mirrors the views of the patient and the politician and each feels that the other is to blame.

Is there any reasonable solution to the problem of insufficient resources for all? Is there a solution that will satisfy doctors, patients and politicians?

First, doctors must be educated, both in medical school and continuing after graduation, about the costs of the procedures and tests that they are using. They should be encouraged in these educational endeavors to use tests and procedures with the best cost/benefit ratio and carry these out only when necessary, regardless of who is paying the bill. In addition, steps must be taken to reduce the physician's fear of litigation which results in over use of medical investigations in an effort to avoid lawsuits.

Patients must be taught to expect less health care and to do more to remain healthy. This will be no small feat, as much of the blame for rising expectations can be placed squarely at the feet of those who control mass media in North America.

A step for patients and doctors alike is to allow death back into the natural cycle of life and to discontinue the current medical attitude of seeing death as an enemy to be defeated at all costs. After all, death cannot be prevented but only delayed and that delay, frequently not even contributing to quality of life, can be very costly, indeed.

Physicians need to encourage the use of living wills and an attitude of allowing death with dignity. Publicly endorsed discussions of euthanasia, with an attempt to develop a public consensus, would allow the development of the idea that expensive heroic measures are not for everyone. It is up to those who have enjoyed their passage and feel they are willing to give up the remainder of their lives so that other younger and less experienced humans may continue to experience what life on this earth has to offer, to inform those who control the loading of the lifeboats of this decision. This should not be a decision that must be made by every person who reaches a specified age, as some persons may have very good personal reasons to finish one particular voyage, nor should it always be required of those who use disproportionate amounts of scarce resources. Society should be able to expect, however, that each of us will consider the limited number of seats in the lifeboats when making our decision.

Redirecting health care is a little like steering a large vessel. You have to begin to turn the rudder well in advance and you have to have someone at the helm who knows what he/she is doing and where the shoals are. There are insufficient lifeboats for the demands of a large-scale disaster and few are prepared to relinquish their places in favour of others. In modern society where situation ethics abound, old truths, like women and children first, are no longer taken for granted and our leaders will do anything to prevent themselves from going down with the ship.

To quote Hans Selye out of context, "We need guidelines which are compatible with the ruthless laws of nature and yet remain morally acceptable to ourselves and other human beings." In our morally pluralistic society this will be very difficult, but we must have the courage to try. □

A Microbiologist's View of Qatar

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Qatar, the middle eastern site of "Canada Dry One," is currently home to over 500 Canadian airforce personnel. In addition to dealing with the tensions of possible hostilities and the harsh environmental conditions, these Canadians may be exposed to some unusual infectious agents, some of which may not be commonplace to the Nova Scotian physician, but which he/she may encounter when these service people return to Canada. I had the unique opportunity to be the Consultant Microbiologist in that tiny country with its considerable infectious disease problems from August 1985 to December 1989. Both the country and its infections offered some interesting challenges.

The State of Qatar occupies a peninsula some 11,437 km^2 in area halfway along the western coast of the Persian Gulf, south of Kuwait, at the juncture of Saudi Arabia and the United Arab Emirates. The landscape is generally flat and lowlying. In the northeast there is some higher ground and modest hills, while on the west coast there are higher areas of limestone and sandstone which do not exceed 98 m in height. In the north, one finds some areas of natural vegetation in contrast to the south, which is arid with stretches of salt flats. Along the southeast coast are sand dunes which slope down into the sea.

Qatar has a moderate desert climate with long summers and short winters. Minimum and maximum temperatures through the year range between 7°C in January and 43°C in August, with the average being between 23-35°C. Rainfall does not exceed 75 mm a year.

Although Qatar has a population estimated in 1986 to be 371,863, only about 20 percent are indigenous residents, the remainder being migratory and expatriate workers from many parts of the world who came to the capital city of Doha to make their fortunes. The majority of these arrive from such countries as India, Pakistan, the Phillipines and Africa. In addition to their meagre possessions, these usually poorer workers also bring their home acquired incubating infections.

Tuberculosis is the most troublesome of the imported infections. The annual incidence of newly diagnosed cases of active tuberculosis in Qatar was 55 per 100,000 population in 1988; as of January 1, 1989 the number of active cases was 153. Although the majority of these were found in the lower classed residents who lived in the confined quarters of camps, many of those infected were Qataries who enjoy a very high standard of living. Due to a comprehensive tuberculosis control program, the diagnostic laboratories of the Hamad General Hospital were kept busy processing up to 50 specimens per day, six days a week. Of these, some 15 percent required workup identifications, and then susceptibility testing when *Mycobacterium tuberculosis* was confirmed. Mycobacteria species other than *M. tuberculosis* (MOTT) were recovered with a higher frequency, but were not tested for susceptibility. The most recent data showed that 18.5 percent of patients had an isolate resistant to one or more of the antitubeculous medications that were tested.

Brucellosis was the next most challenging disease for the Infectious Diseases Team. Sheep are an important part of the Qatar economy as mutton forms a dietary staple in this Moslem and Hindu dominated population. Although live sheep are imported in large quantity from countries as far away as Australia, many of the nomads or Bedouins have their own flocks and indeed, many of the city dwellers also keep one or a few goats for milk and cheese. The drinking of unpasteurized milk is common. The microbiology laboratory would regularly produce 3-8 positive cultures of *Brucella melitensis* per month and serology confirmed the diagnosis in an additional five or six patients. Although some would present with the acute symptoms of classical undulant fever, chronic brucellosis was more frequent and many of these had bone and joint infections. Utilization of a biological safety cabinet did not prevent the acquisition of at least one case of brucellosis in a laboratory worker.

Enteric Infections were prevalent. Both Salmonella and Campylobacter were isolated daily from the 100-150 stool samples submitted for routine culture. *S. typhi* was well known on the enteric bench, but blood cultures were more useful for confirmation of typhoid fever. Shigella were found only three to four times per month, mostly *S. sonnei.*

As expected from a warm country, parasites were regularly found. The most frequent pathogens were Giardia and Schistosoma. *Entamoeba histolytica* was third highest on the extensive list of pathogens and commensals that were identified. *Ent. coli* was reported in 300-400 fecal specimens per year. The search for Cryptosporidium was only just beginning, but was proving quite successful.

Diphtheria cases were of great interest. Three times over the four years these occured singly, and once there was a family outbreak involving three siblings. These cases invariably created quite a turmoil, often involving unnecessary heroic measures and masses of throat swabs. There was one death, in a three month old male child.

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On two occasions toxin production was verified. A complication for the laboratory was that diphtheria became high on the differential diagnosis list whenever a sore throat was presented to the general practitioners.

Sexually Transmitted Diseases were no surprise as every nation, save one, is likely represented in Qatar. I suspect that many of the affluent residents went to other than the local hospital for such complaints and, as in most places, STDs were grossly underreported. I did however, collect data which demonstrated that penicillinase-producing *N. gonorrhoeae* were found in close to 50 percent of the isolates. The microbiology lab was not responsible for syphilis serology and diagnosis of Chlamydia was just beginning. Acquired immunodeficiency syndrome was officially admitted in Qatar before many other Arab countries did so. Of the 20 or so reported cases, about five were still under treatment at the time I left the country.

Medical Services in Qatar are, for the most part, well developed. There is the 500 bed General Hospital; a new 288 bed Womens' Hospital, which performs over 10,000 deliveries per year: and a rehabilitation unit. The medical staff currently are primarily Egyptian, although other Arab countries are represented, and a few western physicians remain. The Hamad Medical Corporation is recognized as a training centre for medical students who will sit the Arab Board examinations. The laboratory is more than adequate, offering a wide range of services, although some tests are still referred out to Europe or the United States. The microbiology section is semi-automated with a BACTEC for blood and tuberculosis cultures and a SCEPTOR system for bacterial identification and MIC susceptibility testing. The technicians are mostly from the Phillipines or India, although Qatari women are beginning to occupy positions as they complete their training at Qatar University's Biomedical Sciences program. This was developed and implemented in co-operation with the Consultants in the Department of Laboratory Medicine and Pathology at the hospital. While most laboratory directors will say their facilities are stressed beyond capacity, such a claim in Hamad General Hospital was not mere rhetoric, but a painful fact of life.

Life in Qatar did not cease at the end of the work day, although for some it was a real enough hazzard. Most of the ammenities enjoyed in our western society are lacking in this Moslem dominated country that imposes many restrictions on custom, dress, entertainment and expression of personal freedom. Once one has seen the National Museum and the Zoo, both of which are excellent, you are pretty much left on your own to find things to occupy your time. There are outdoor sports such as tennis, golf — mind the sand traps — soccer and jogging in the desert. Darts is quite popular. One could attend a camel race and even acquire the skill of riding one of these 'ships of the desert'. The amateur theatre group occupied many hours for some. There also is gardening — just about anything will grow in Qatar if given enough water. Bridge groups and sewing circles can also be found. Couch potatoes are in trouble as the television programming is censored to the extent the T.V. is used mainly for movie videos, which are also censored. There are some excellent hotels serving good meals but, without alcohol of any kind, some would find the experience dry. Home use of alcohol is permitted, sometimes leading to abuse. Unless a person developed special interests, then the job itself would have to prove entirely satisfying; not an easy task in Qatar.

There is a sign on the highway to Umm Said, an industrial area to the south of Doha, containing an oil refinery, liquid natural gas plant, and a steel works, which reads in part: 'The sea is our life . . .'. For me, the sea was the salvation to life in the Middle East.

There are 700 km of coastline in Qatar. The water which is warm, clear, and relatively shallow with depths seldom exceeding 20 m, has several offshore coral reefs which make Qatar ideal for scuba diving. Through the many wonderful people, expatriates and Qataries alike, that I met in the Doha Sub Aqua Club, a branch of the British and Sub Aqua Club, every weekend saw myself and family enjoying the sandy beaches and blue-green waters of the Gulf. I improved my own diving skills and qualifications so that I gained the Advanced Instructor level, and the nondiving members of the family all became active sports divers. The diving was often combined with desert bashing rides in four-wheeled vehicles over the sand dunes to campsites on the 'Inland Sea'. The term 'life is a beach' took on a real meaning. These activities evolved into a very active social circle such that the time in Doha was far from dull.

Contact between the Canadian service personnel in Qatar or the naval forces in nearby Bahrain, with the local population will most certainly occur. When I lived in Doha, the British community delighted in playing host to visiting United Kingdom sailors and reports from Qatar indicate a similar hospitality is being offered by the resident Canadians. Undoubtedly our service personnel will visit the quaint food shops to sample the aromatic dishes prepared in the traditional Arabic and Indian manner. What tourist can resist the colorful, but crowded, shopping souks where haggling with the merchant is half the fun of purchasing that souvenir for someone special? While the epidemiology of the diseases mentioned previously, sometimes requires prolonged or intimate contact for the acquisition of the etiological agent, it is not beyond the bounds of possibility that such diseases, or their sequelae, may be brought to the attention to the practioner in Nova Scotia. An unwelcome souvenir of time spent in the Persian Gulf. □

Current Topics in Community Health

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MAKING SENSE OF PRIMARY HEALTH CARE DELIVERY OPTIONS

Primary health care in Nova Scotia has been named one of the five precepts underlying the *Health Strategy for the Nineties.*[1] This document defines primary health care as the first level of contact of the public with the health system. It places particular emphasis on health promotion and disease prevention, and includes treatment services. The other precepts (which can be partially fulfilled through primary health care) include offering the full continuum of care; a health system which is community-based, flexible and responsive to users' needs; services and programs that are comprehensive, integrated and coordinated; and an effectively planned and managed system that reduces the rate of growth of health expenditures.

The Canadian Co-operative Association contracted two respected Canadian health policy analysts, Doug Angus and Pran Manga, to review the effectiveness of co-op/consumer-sponsored health care delivery mechanisms.[2] Their inventory of the various models of what are essentially primary health care delivery strategies, and their critique of their relative effectiveness, provide insightful reading for providers, planners and consumers considering new models for implementation in Nova Scotia.

Alternative Models of Primary Health Care Delivery

There are a variety of health care delivery models in Canada which address the delivery of comprehensive preventive and primary care and related social services, as alternatives to the existing system of fee-for-service medical care. They offer a wide variety of services such as: health services (e.g., treatment, promotion/education, prevention, and home care); diagnostic services (e.g., laboratory services); allied health services (e.g., physio/occupational therapy, dental services, pharmacy, dietary, and placement and coordination services); social services (e.g., information and referral services, mental health services, crisis and emergency services, support services, counselling services, legal counsel); and community services (e.g., food banks, day care centres, recreational services).

Most community health centres are sponsored and managed by an incorporated non-profit community board that is directly accountable to the public. The board's duties include the appointment of the executive director, the establishment of the mission statement, goals and objectives of the centre, and its policies and priorities. Its most important function is to direct the centre to meet the needs and expectations of the community.

Types of alternative delivery models include the Co-operative Health Centre (COOP), Community Health Centre (CHC), Health Service Organization (HSO), Local Community Services Centre (CLSC), Comprehensive Health Organization (CHO) and Multi-Service Centre (MULTI). These models offer varying degrees of community participation. Community participation is particularly important in CHCs, CLSCs in Québec, and COOPs (Table I).

TABLE I

ATTRIBUTES OF ALTERNATIVE HEALTH CARE DELIVERY MODELS

Attribute	Community Participation Models		
	CHC	CLSC	COOP
A. Organization & Management	M	M	M-H
Community Participation	M	M	M-H
Funding Flexibility	L-M	M	M
B. Range of Services	M-H	M-H	M-H
C. Accessibility	M	M	M
D. Quality of Care	M-H	M-H	M
E. Economic Performance	M-H	M	M-H
F. Implementation Efficacy	M	M	M-H
Shift the System	M-H	M-H	M-H
Linkages	M	M	M
Community-Based	M	M	M-H

Legend: CHC = Community Health Centre; CLSC = Local Community Services Centre; COOP = Co-operative Health Centre; L = low; M = medium; H = high

Community Participation Models

The Community Health Centre is sponsored by representatives or groups located geographically within the community; the latter usually is a defined area that the centre is servicing. The CHC is managed by an elected Board of Directors which generally includes client representation. Medical services are provided, complemented by preventive health, social and community development services. CHCs receive funding on a program line-by-line basis. The CHC does not get penalized if 'clients' seek services elsewhere.

The Local Community Services Centres in Québec are government-sponsored, but are managed by a Board of Directors comprising two government representatives and five elected local (community) people. The term 'community' refers to a restricted geographic area or district. These centres provide ambulatory care health

services, primary social services, integrated services (with the focus on home care, mother and child, and schools), community organization, and prevention. The purpose of the CLSC is to integrate the health and social system at the local level. CLSCs are funded by government to serve a defined geographical area. No financial penalties are applied if clients obtain services outside their boundary. Budgets are program-oriented and, hence, one weakness is the multitude of separate program budgets with which the CLSCs must contend.

Sponsorship in the Health Co-operative Model is through co-operative membership, i.e., members are both the users of services and the determining agents of which services will be provided. Management occurs through the Board of Directors who are elected from the member users of the co-operative. While the CHCs involve the community on the Board, membership control and ownership are not nearly as extensive as with the COOP model. COOPs provide medical, preventive and social services. The emphasis is on prevention, education and specialized programming in the provision of these direct health services. With the COOP, funding usually is done on the basis of budgets or capitation/negation.

Quasi-Community Participation Models

Quasi-Community Participation models comprise Health Service Organizations (HSOs), Comprehensive Health Organizations (CHOs), and Multi-Service Centres (Multis). Each of the models in this "quasi" category may or may not emphasize community involvement in the organization or management of the centres (Table II).

TABLE II

ATTRIBUTES OF ALTERNATIVE HEALTH CARE DELIVERY MODELS

Attribute	Quasi-Community Participation Models HSO	CHO	MULTIS
A. Organization & Management	L-M	L	L-M
Community Participation	L-M	L	L-M
Funding Flexibility	M-H	M-H	M-H
B. Range of Services	L	L-M	L-M
C. Accessibility	L-M	L-M	M
D. Quality of Care	L-M	L-M	—
E. Economic Performance	M-H	M-H	—
F. Implementation Efficacy			
Shift the System	M-H	M-H	M-H
Linkages	M	M	L-M
Community-Based	L	L	L-M

Legend: (H) High, (M) Medium, (L) Low, (—) Unable to say
HSO = Health Service Organization
CHO = Comprehensive Health Organization
MULTIS = Multi-Service Centre

Depending on sponsorship, Health Service Organizations may be for-profit or not-for-profit. Most of the HSOs are physician-sponsored and, as a result, there is little community input or participation. Services offered by the HSO include physician services (both primary and specialty) and health promotion/education and prevention. HSOs receive capitation payments to provide services to voluntarily rostered members and are financially accountable (i.e., "negated") for comparable services received outside the HSO.

The Comprehensive Health Organizations provide a broad range of vertically integrated medical and health care (primary, secondary and tertiary) services. Depending on the community, social services may be included as well. Strictly speaking, therefore, the CHO is not a primary care organization. CHOs can be sponsored by the community, a hospital, a university, an HSO, a CHC, physicians, etc., and it is possible to have co-sponsorship. The CHO is managed and controlled by a Board of Directors who are elected/chosen from its members/enrollees. For CHOs, funding is based on capitation which is derived from the total provincial cost of health care for a given population and ultimately refined for a specific region. This is not the same capitation formula used for HSOs. Relatively large numbers of healthy enrollees are required to make the CHO a viable concept.

Multi-Service Centres can be sponsored by the government, community or private sector. The Multis are managed and controlled by a Board of Directors whose members are appointed by the government to be representative of the community. Multis provide a range of services, the extent to which depends on the needs of the community and the organization's mandate, i.e. social services, or health promotion/education, or emergency/diagnostic services, etc. Multis may receive public, private and non-profit sector funding. Being able to use this variety of funding sources is thought to be a strength of this particular model.

In the Minimal Community Participation group of alternatives are Hospital Affiliated Ambulatory Care Centres (HOSPs) and Physician-Based Ambulatory Care Centres (PHYS). Neither of these models emphasizes community involvement in the organization or management of the centres.

HOSPs are not-for-profit and are sponsored by the hospital and are managed/controlled by the hospital Board of Directors. The goal of these centres is to provide ambulatory care services either at or near a hospital, or through a free-standing, remote centre affiliated with a hospital. They are funded out of the hospital's overall global budget, or by a separate operational budget for the centre which is allocated by the hospital. Services offered by the HOSPs include hospital-type non in-patient services (emergency services, public health nursing, home care coordination, etc.). Primary care physician services are not included. One of the strengths of these arrangements is that affiliation with a hospital can lead to the provision of a fuller range of services, especially through links to the hospital for in-patient care.

PHYS are for-profit polyclinics, sponsored by individual physicians and managed/controlled by

physicians and/or private companies. Their aim is to provide medical services during convenient hours through "walk-in clinics" or through off-hours telephone networks. These are a common Canadian model, funded by the fee-for-service system.

Cost-effectiveness of Alternative Models

The co-operative, consumer-sponsored community health centres, and similar such health care delivery models are generally found to be cost-effective relative to fee-for-service practice. Angus and Manga did not encounter a single study that demonstrated the contrary.

The principal reason for the overall cost-effectiveness of the community clinics is the significantly lower hospital utilization of clinic clientele compared to those of fee-for-service practitioners. The not fee-for-service modalities have been shown repeatedly to generate rates of hospital utilization from 10 to 40 percent below fee-for-service physicians.[3] The reduction is associated primarily with reduced rates of admissions. In HSOs, for example, admission rates are 15 percent lower than fee-for-service patients, whereas the average length of stay is just 5 percent lower for HSO patients. Drug and overall costs of patient care are also reduced.

Earlier recognition and treatment of disease, ambulatory investigations, early discharge options, day surgery, and the integration of health and social services to permit continuity of care, are among the factors cited for the lower hospital utilization rate.

Another factor related to cost-effectiveness of community health clinics is their more effective use of nurses, nurse practitioners, midwives, physiotherapists, occupational therapists and nutritionists,[4] in their multidisciplinary approach to service delivery.[5] Lomas and Ableson have shown that community health centres use more non-physician health personnel than HSOs (and, of course, fee-for-service practices).[6] Notably, the community health centres were more likely to use nurses and nurse practitioners for preventive screening services.

Co-operative and community health centres are likely to make more and a wider range of services accessible to groups who would otherwise receive inadequate or even inappropriate care. The centres are widely acknowledged to improve access to health and social services to ethnic minorities, the poor, immigrants, native peoples, and other disadvantaged socioeconomic groups.

Other efficiency advantages are also claimed for community clinics. The provision of out-patient and support services (x-ray, laboratory, physiotherapy, etc.) through community clinics can often be substantially less costly than provision of the same services through hospitals.

Quality of Care

In several studies, the CLSCs in Québec were shown to provide better quality of care for patients with headaches;[7] more complete childhood immunization;[8] more appropriate cancer screening;[9] and better cancer prevention services.[10] In general, community health models are better structured to provide preventive and health promotion services.

There is a paucity of studies comparing quality of care between different modalities in Canada. Several American studies suggest that there are no differences between Health Maintenance Organizations [(HMOs): similar to Canadian HSOs except that they provide in-hospital services and are often profit-driven] and fee-for-service physicians in terms of quality of care. Nor is there any evidence in Canada that HSOs or community health centres provide lower quality of care than fee-for-service physicians or that patients are less satisfied with their care.

Reasons for Limited Growth

Given that the community-sponsored models of primary care delivery seem to offer an "answer" to our expensive, uncoordinated, and occasionally inaccessible primary health care system, why have they not been more widely adopted? Inadequate funding has been a major reason for the lack of growth of these centres as well as limiting the scope of their programming. The lack of genuine and facilitative administrative support from public servants in the provincial departments of health has also restricted their growth in number and size.

Opposition to the centres by hospitals, but mainly and most vociferously by the medical profession, is perhaps the most important reason for their limited growth. These centres often have difficulty retaining medical personnel because their budgets force them to pay unrealistically low pay scales, especially when it comes to recruiting specialists.[11] High turnover rates disrupt team efforts and continuity and reduce the morale of the centre. Patients too are dissatisfied with the uncertainties and the discontinuities such high turnover rates engender.

Other obstacles to the expansion and growth of CHCs are the views that they constitute an "add-on" and not a substitute for existing services and that they best serve marginal groups, rather than the general population.

Conclusion

Several community participation models are viable for meeting both government and community health priorities and objectives. Not every model will work in every community. The choice in each community will vary and the "best" model, in the end, is the one which best reflects the particular nature and needs of the community to be serviced. Rather than pursuing a specific model, it would be better to ensure that the chosen model has certain important characteristics: relatively easy for providers to identify with the model's mission, goals and objectives; financial and professional incentives to promote cost-effective use of resources; decentralized decision-making which emphasizes accountability and responsibility; and provision of services which match patient needs with quality assurance mechanisms in place. □

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An Appreciation

DR. MARGARET CAMERON GOSSE

May 15, 1903-Oct. 22, 1990

Dr. Margaret Gosse was born in Ontario, moved to Montréal at age four and was educated in Westmount schools. One of the early women medical students accepted at McGill University, she often recounted the fact that female doctors were not allowed to eat in the Doctors' dining room, but were relegated to the Nurses' dining hall. After graduation she spent time travelling in Europe, doing research in England, and on the staff of the Royal Victoria Hospital in Montréal.

She married Dr. Norman Gosse in 1939 and was immediately asked to join the teaching staff at Dalhousie University in Halifax, to help Dr. H. G. Grant fill the gaps caused by the departure of the local staff who had gone overseas. About this time she inaugurated the Red Cross Blood Donor Service for Nova Scotia. Dr. Beecher Weld worked closely with her at this time, when they travelled to towns and rural areas instructing in the processing of blood sera. She always enjoyed this work as she met so many of the real Nova Scotians, as she put it.

In 1948 Margaret joined her husband on the Board of Directors of the Nova Scotia Division of the Cancer Society and was the first Chairperson of Education. It was during these years that this work expanded under her guidance. In 1958 she became Provincial chairperson of Welfare Service and a member of the National Committee. In 1962 she was elected President of the N.S. Division and a representative of the National Grand Council. In 1985 she was elected chairperson of the Advisory Committee of the "Lodge that Gives".

As the wife of the President of the CMA she travelled extensively across Canada and later around the world on various Health Programs. She was editor of the *N.S. Medical Bulletin* from 1946-1949. Passionately fond of music, she, Dr. Laufer and the late Dr. Charlie Jones met and managed to organize a few concerts in the ball room of the Lord Nelson Hotel. This was the humble beginning of our Symphony Nova Scotia. She acted as President of the Symphony and Symphony Auxiliary, and contributed generously to the Symphony, Scotia Festival of Music and the Kiwanis Music Festival throughout her life.

She was confirmed into the Anglican Church on her marriage and in typical Margaret Gosse fashion involved herself in the duties of the Sanctuary Guild — cleaning brass and silver and providing flowers from her garden, not to mention financial support. In 1982 she received an honorary Doctor of Common Laws degree for community service, from the University of King's College.

She was a voracious reader of everything from serious medical journals to mystery stories to new childrens' books; it was all grist to her mill. A knowledgeable gardener, her property was always in apple pie order and woe betide some young fellow who did not prune the forsythia brushes properly. An animal and nature lover she kept a succession of German Shepherds and Siamese cats. Her bird-feeding table welcomed pigeons and squirrels as well as more exotic visitors.

Despite severe arthritis, which eventually confined her to the house, she kept in touch with everything and her wry sense of humour never deserted her. At the age of eighty-seven she died quietly in her sleep.

When Thou are with me
Go I gladly to my rest;
My end will be so easy
When you close my weary eyes.

(J.S. Bach)

was sung at her funeral.

Dr. and Mrs. E.F. Ross
Halifax, N.S. □

Randomized clinical trials will never be immune from criticism. However, it is important to bear in mind that most of the criticism of these experiments has come in reaction to trials that have failed to confirm the benefits of popular treatments. These are the very treatments for which meticulously run randomized clinical trials are essential to change the beliefs and practices of the clinicians who are responsible for the health of our nation.

William D. Dupont

An Appreciation

DR. DUGALD H. THOMSON

Doug Thomson, the first Director of the Cancer Treatment and Research Foundation of Nova Scotia, and formerly Professor and Head of the Department of Radiation Oncology at Dalhousie University and Head of the Department of Radiation Oncology at the Victoria General hospital, died suddenly on September 18, 1990 in London, Ontario.

He was born in Glasgow, Scotland in 1924 and graduated from the Glasgow University medical school in 1947. This was followed by three years military service in the Royal Army Medical Corps during which he was stationed at Malta. Following demobilization, he undertook postgraduate training in radiation oncology in Glasgow and received the DMRT (London) in 1952. He emigrated to Canada the next year and was appointed as a radiation oncologist at the London Clinic of the Ontario Cancer Treatment and Research Foundation where he remained until 1980. In 1954 he obtained the CRCP in radiotherapy and was awarded the FRCP(C) in 1972 and was elected FACR in 1980. This was the year in which he was recruited to become the first director of the CTRFNS and the first professor of radiation oncology at Dalhousie University. He retired in 1989 to London, Ontario.

Dr. Thomson was one of the last all-round radiation therapists who truly specialized in the non-surgical treatment of cancer and was also one of the earliest chemotherapists. His main clinical interests were in relation to tumours of the head and neck, and gynecological malignancies. He had a life-long interest in medical records and was the Director of the Tumour Registry of the CTRFNS until his retirement. His expertise in this field was acknowledged, and he was an advisor to the medical records departments and tumour registries in several hospitals and other provinces.

The first prototype cobalt-60 unit became available for clinical use in 1951. Cobalt-60 was originally discovered in 1936 and the first two prototypes for radiotherapy were developed in 1949 by Atomic Energy of Canada Limited at Chaulk River in Ontario. They produced two kilocurrie cobalt sources from their NRX reactor and these first units were established in Saskatoon and London. The first patient to receive supervoltage irradiation was treated in London in October 1951, just three years before Dr. Thomson arrived in Canada. In 1957 he reported, together with Ivan Smith, probably the first paper on the use of cobalt-60 radiation to treat oral cancer. In 1964 Dr. Thomson was a co-author of the first book published on supervoltage cobalt-60 irradiation. They reported a series of 4600 patients treated over a 10 year period with the original Eldorado kilocurrie stationary unit and subsequently with a rotational hectocurie plant. This book, outlining the clinical experience and treatment technology became a standard work and was a required reading for radiation oncologists, radiation therapy technologists and clinical physicists for many years.

Outside of medicine Dr. Thomson was an avid gardener and spent many happy hours in his English garden. Golf was another great love and he was a long-time member of the London Hunt Club. He is survived by his wife Nan whom he married 33 years ago, by three sons and one daughter and four grandchildren. He will be sorely missed by his colleagues and friends in Nova Scotia and Ontario.

P.J. Fitzgerald, M.B.
Physician-in-Chief
Cancer Treatment and Research Foundation of Nova Scotia □

DOCTORS, DOLLARS AND DEFICITS

Continued from page 25.

of reductions in undergraduate class size on the rate of growth will not be realized for many years. Fiscal pressures on governments are likely to persist at current levels, or deteriorate further, unless Canada's real economic growth improves dramatically. So the prospect is that the major players in Canada's health system will be forced to find workable solutions to the many dilemmas posed by complex issues and relationships involving growth in doctors, dollars, and deficits. □

Correspondence

To the Editor:

OXYGEN AND NURSING HOMES

In Nova Scotia patients with pulmonary diseases which require oxygen enrichment in the inspired air may receive oxygen at home but they may not be admitted to a nursing home. The reason generally advanced for this is fear that the oxygen constitutes a fire hazard and would endanger the safety of the other residents in the nursing home. I recently undertook a little study to determine whether this fear is justified.

A volunteer was administered supplementary oxygen, and the oxygen concentration at various positions around the volunteer's face was measured. Two different models were adopted. In the first, 100% oxygen was delivered through nasal prongs at a rate of 2 litres per minute. In the second, representing a "worst case scenario", 100% oxygen was delivered by mask at a rate of 10 litres per minute. Oxygen concentrations were measured with a standard battery operated oximeter at varying distances from the patient's face. Each measurement was repeated three times.

The results were as follows:

1. Nasal Prongs

With the probe held immediately beneath the nostrils at the level of the lips, brief spikes in oxygen concentration could be detected, with the concentration rising 2% with each exhalation. With the probe held in a position corresponding to the tip of a cigarette held between the lips, no change in oxygen concentration could be detected.

2. Mask at 10 Litres per Minute

Three centimetres from the side port of the mask directly in the outflow from the mask, brief peaks to 31% oxygen were detected. Ten centimetres from the mask no changes in oxygen concentration could be detected.

The first model, nasal prongs at 2 litres per minute, represents the usual clinical situation. It is noteworthy that even if the patient himself were smoking, the concentration of oxygen in a position corresponding to the tip of his burning cigarette would be identical to room air. Only if he were to smoke the cigarette right down to the butt would the concentration of oxygen around the tip of the cigarette be detectably higher, and even at this point, a rise in 2% (from 21% to 23%) would be most unlikely to have any actual effect on the burning of his cigarette. Clearly, the patient receiving nasal oxygen constitutes absolutely no hazard to the other residents in the nursing home, as the oxygen concentration, even 2 cm away from his face, is identical to that in the surrounding room air. If the patient can safely use oxygen at home, there is absolutely no evidence that he cannot do so with equal safety in a nursing home.

The second model involves delivery of oxygen at a rate markedly greater than anything which is normally encountered in the outpatient setting. Even here, at a distance of 10 cm from the patient, the oxygen concentration is identical to room air. Close to the patient's face, the concentration of oxygen is probably high enough to result in a significant enhancement of combustion, for example, of a cigarette. One can conclude that patients receiving 10 litres of oxygen by mask would be unwise to smoke. The risk to people around them is, however, obviously essentially negligible, as at a distance of 10 cm from the patient the oxygen concentration is identical to room air.

This study may well be criticized on the grounds that it is overly simplistic. It does, however, strongly suggest that the reason generally advanced for refusing admission to nursing homes by patients who are receiving supplementary oxygen, i.e. concerns for safety, are of highly dubious validity. There are significant numbers of patients who cannot be discharged from hospital because they require care beyond that which can be provided at home, and whose only barrier to nursing home admission is the need for supplementary oxygen. It is enormously expensive to keep these patients in an acute care hospital. I would suggest that the existing policy prohibiting nursing home admission for patients on supplementary oxygen is well worth re-examining.

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