

ASSESSMENT OF THE PERFORMANCE OF PRACTICING PHYSICIANS IN CANADA

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BACKGROUND

Traditionally, much energy and resource has been expended on the evaluation of physicians in training prior to granting a licence to practice. Once in practice, it was believed that complaints from patients would identify physicians with performance problems. More recently, it has been recognized that it is a responsibility of medical licensing organizations to proactively ensure that physicians maintain their clinical ability throughout their careers.

In Canada, the initial steps in developing programs for assessing the practice performance of physicians have been taken by the medical licensing authorities. These programs arose from the need of the licensing authorities to ascertain whether physicians were generally competent to practice, once they were identified by patients who lodged complaints. They are now being broadened to eventually evaluate all physicians in practice.

THE MEPP PROJECT – ESTABLISHING A NATIONAL APPROACH

The Monitoring and Enhancement of Physician Performance (MEPP) Project established a national template for evaluating physician performance in Canada and was supported during its development by the Federation of Medical Licensing Authorities of Canada (FMLAC). This developmental phase included a three-year collaboration with the Association of Canadian Medical Colleges (ACMC), the Medical Council of Canada (MCC), the Royal College of Physicians and Surgeons of Canada (RCPSC) and the College of Family Physicians of Canada (CFPC). This extensive project brought together expertise from all of the medical organizations in Canada and reached a consensus on a unified approach to evaluation of physician performance in practice.

Development of MEPP

In May 1993, the Board of the FMLAC recognized the importance of regularly reviewing the performance of practising physicians in order to maintain public confidence in the medical profession. As medicine became more complex, it was no longer adequate to assume that physicians would themselves ensure that they stayed up-to-date with the latest medical advances. The FMLAC believed that ongoing review of performance must be established as an accepted process for medical practitioners. They also believed that it was the specific responsibility of medical licensing authorities to monitor and guide the profession in maintaining quality medical practice. The FMLAC, therefore, voted to support and facilitate a national initiative, including all medical organizations across Canada, to develop a process which could be uniformly employed in all jurisdictions in the country, to review and promote excellence in practice.

It was recognized early in the discussions that no single medical organization could take on this task alone. Rather, it was imperative that all medical organizations work in collaboration to minimize the duplication of their resources during times of constraint and to utilize the specific expertise of each organization to assist with this important program.

It was agreed that a series of collaborative workshops would be the optimal way to embark upon the first stage of development. The first two-day workshop was held in Aylmer, Quebec and came to be known as "Aylmer I".

It quickly became apparent that it was necessary for participants at the workshop to agree upon definitions for a number of important concepts, in order to lay the foundation for the workshop discussions that followed. The main definitions adopted were the following:

- *Competence* – the ability to appropriately apply knowledge, skills and attitudes.
- *Performance* – the translation of competence into action when managing patient care.
- *Maintenance of competence* – the dynamic process of assessing and updating knowledge, skills and attitudes to meet the needs of current practice.

Participants agreed that since the performance of the physician was what mattered most to patients, (rather than a potential to perform, or "competence"), performance should be the target of all programs of assessment.

Thus, February 1994 marked the beginning of a series of dynamic workshops dedicated to the development of a national approach to monitoring and enhancement of physician performance. Highlights of each workshop follow:

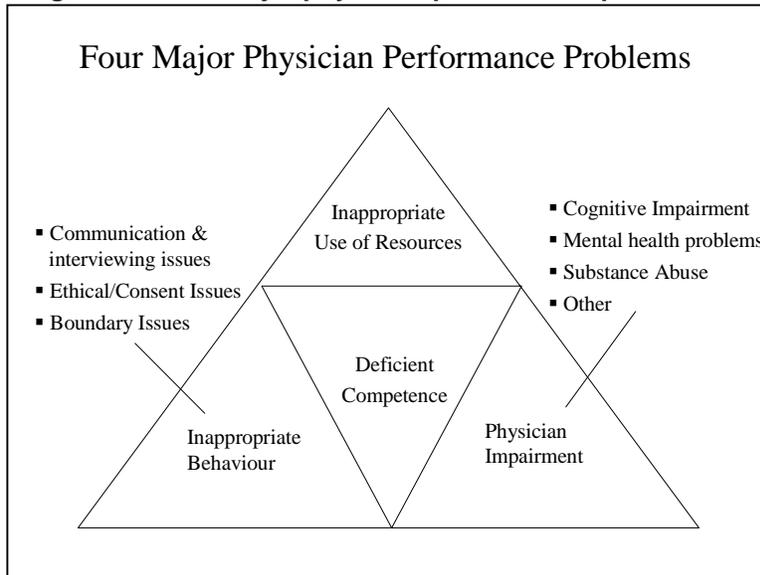
Aylmer I – February 1994 (Definitions and Categories for Performance Issues – Setting the Stage)

This first two-day workshop included participation from representatives of all medical organizations in Canada. Initial discussions led to the conclusion that performance problems could be classified into one of four categories:

1. Inappropriate behaviour
2. Inappropriate use of resources
3. Deficient competence
4. Physician impairment

It was further recognized that any monitoring system must address all four categories of performance problems. Eventually, a consensus was reached on the role of the Federation and the Licensing Authorities in the monitoring and enhancement of physician performance.

Diagram A: Four major physician performance problems

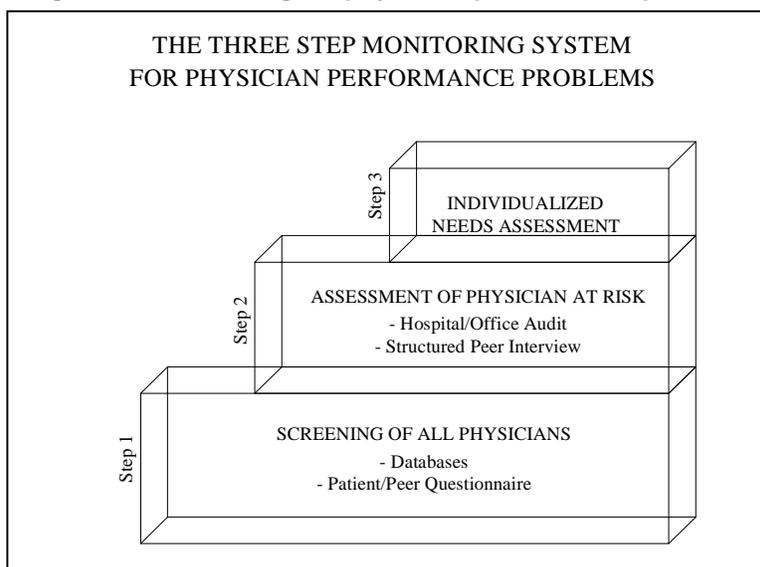


Aylmer II – February 1995 (Methods for Monitoring Performance)

The second workshop, held again in Aylmer, Quebec in February 1995, focused on acquiring knowledge and sharing expertise on actual monitoring methods and proposing a workable system for monitoring all physicians in practice at regular intervals. This led to the design of a three step monitoring process:

- Step 1 - Screening of all physicians in practice
- Step 2 - Assessment of physicians at risk
- Step 3 - Individualized needs assessment (in depth clinical evaluation)

Diagram B: Monitoring for physician performance problems



Aylmer III – February 1996 (Education and Remediation)

At this final developmental workshop, participants considered feedback techniques with respect to those physicians at the screening process who were identified as:

1. "Little or no risk," ie. no serious deficiency found (90% of total)
2. At risk, or in need, with respect to the specified area of performance (10%).

It was determined that the feedback approach to the first group (little or no risk) should be:

- personalized;
- confidential;
- educational and supportive;
- allowing comparison with peers;
- explicit and meaningful;
- timely;
- regular;
- linked to monitoring tools; and
- ongoing process starting in medical school.

Above all else, participants agreed that highlighting the core qualities of the good, (excellent) physician should be stressed at least as much as the negative feedback for those physicians at risk.

For the smaller, but significant (10%) group, who were determined to demonstrate performance problems and required significant intervention, it was decided that the feedback approach should be:

- immediate;
- non-judgmental;
- given in person by a peer;
- include clear follow-up plan; and
- allow the physician to be accompanied by a support person.

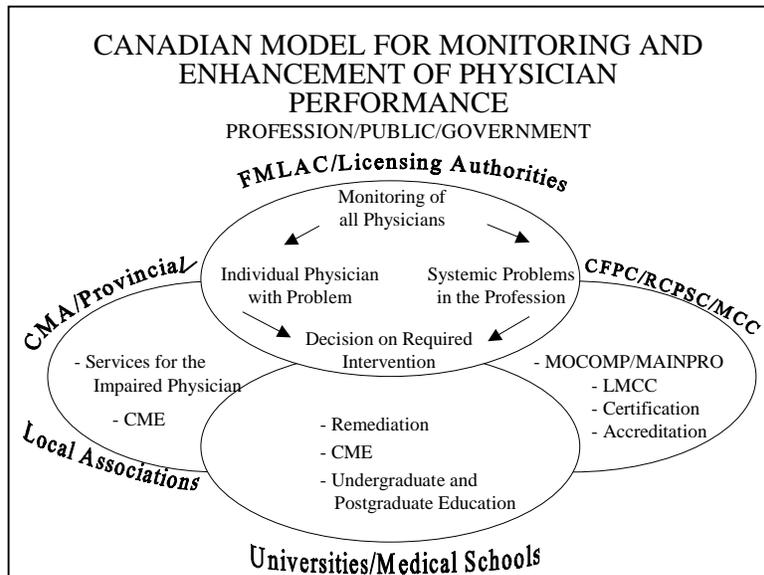
It was recognized that many enhancement programs are in place in Canada which intuitively address the different performance problems identified in physicians. However, research in the field of improvement of physician performance is scanty and requires attention in order for the MEPP project to ultimately be successful.

Outcome of MEPP

The three MEPP workshops succeeded in delineating a common national approach for eliciting, describing, and dealing with performance problems in physicians. A diagrammatic representation of the Canadian model appears in Diagram C. This model acknowledges that the licensing authorities must work in close collaboration with the certifying and accrediting organizations, the medical schools, the local medical associations and the government in order to effectively implement all steps of the model. A simple example of this collaboration would be that although a licensing authority may conduct an assessment of a physician's practice and determine that there are deficiencies present which need to be addressed, in all likelihood the educational process necessary to improve the physician's

performance would be provided by a medical school or medical teaching program. Similarly, services for impaired physicians whose performance may be suffering due to their incapacity already exist at most medical associations, and physicians should therefore be referred from the licensing authority to the appropriate assistive program for treatment. Terms and conditions may need to be placed on the physician's licence by the licensing authority while the treatment program is in process.

Diagram C: Canadian model for monitoring and enhancement of physician performance



After Aylmer

Following the initial Aylmer workshops, many jurisdictions in Canada began to develop or enhance monitoring programs and remedial opportunities for practicing physicians. Many provinces already had certain parts of the three step model in place and began the task of filling in those steps which they did not already possess. There was a desire across the country to be able to share information regarding development of evaluation and remediation procedures for practicing physicians and it was, therefore, decided that a subsequent workshop should be organized to allow for this progress to be shared across the country.

Aylmer IV – 2000 (MEPP 4 Years Later...)

This follow-up workshop held in conjunction with the Annual General Meeting of the ACMC in Whistler, British Columbia, allowed medical organizations across Canada to exchange information regarding progress made to date in implementing the MEPP model. It was an opportunity for each province and territory to showcase its assessment and remediation programs and to learn from the experience of colleagues in this field. Each provincial licensing authority shared information about its current assessment and remediation/enhancement programs. National organizations (FMLAC, MCC etc.) reported on their role in various programs. Workshops were held to identify common processes for

the assessment of physicians and the management of issues of remediation and enhancement.

Conference participants recommended that FMLAC bring together all relevant parties in the near future to oversee the planned next steps, which are:

- establishing national standards for assessment of physicians in practice;
- designing and developing standardized training programs for remediation and enhancement of physicians with identified problems; and
- developing a strategy to promote acceptance of a national MEPP program by the profession, government and public.

Summary of MEPP

The MEPP project, utilizing a collaborative process, succeeded in establishing a national model for the assessment and enhancement of physician performance in practice in Canada by:

- establishing a common terminology;
- describing categories of performance problems;
- developing a step-wise system for monitoring all physicians;
- describing approaches to remediation; and
- defining a framework model for a collaborative approach by all medical organizations to implement the established process.

This served to actively promote the development of consistent and scientifically-sound assessment and remediation processes for all jurisdictions in Canada.

GENERAL CONCEPTS

One of the most important lessons of the MEPP Workshops was to establish the clear distinction between the definition of “competence” and “performance.” With the realization that performance, as the reality in practice, is more pertinent than competence, which simply describes a potential for performance, it became apparent that assessment and remedial approaches must concern themselves with “performance” rather than “competence” alone. The performance of a doctor in their practice is, of course, what is important to patients. What the physician “could have done,” or “might have done,” or was “capable of doing” but did not do, is of little consequence. Therefore, the general understanding that we must concern ourselves with performance, and understand the distinction, underscored all progress from that point on.

It was also apparent that most existing assessment programs centred around competence rather than performance, because competence is much simpler to measure. Multiple-choice tests, which mainly assess knowledge, have been the mainstay of assessment of physicians until recently, due to their ease and economy of administration. Technical skills have begun to be assessed in the last two decades through OSCEs (objective structured clinical examinations) and various testing stations with x-rays, laboratory slides, etc. Knowing that competence is the combination of knowledge, skills and attitudes, how do we address attitude? Due to the complex diagnostic decision-making and therapeutic options available

to physicians today, judgment has become an issue which clearly is as important as knowledge or skills. How can the attributes of appropriate attitude and judgment be assessed? Work is just beginning on these challenging questions.

A true performance assessment will take into account all of these elements in a physician's practice. The most appropriate way of ascertaining whether a practitioner is performing at the standard expected is to observe their activities in real life in each setting in which they work. For example, the Ontario Specialties Assessment Program sends a trained peer assessor into the practice setting of the subject physician for at least three days. During this time medical records are reviewed, a selection of colleagues are interviewed, all practice settings are visited, all procedures that the physician performs are reviewed, and direct observation of as many aspects of the practice as possible are performed. This, of course, requires consent from the patient and means that the assessor must ask each patient prior to the procedure whether they will allow the assessor as a "physician colleague" to observe their doctor performing the procedure. The Ontario experience demonstrates that patients rarely deny this permission, and therefore, the Specialties Assessment Program has been successful.

An assessment process which depends on observation requires highly-skilled assessors who must be appropriately oriented and trained. Assessors, being human and being peers, do not find it easy to make negative statements about their colleagues. They must be supported in doing so, if the situation warrants, in order that an accurate assessment may be obtained.

Conducting an accurate assessment is the first step; writing a report which truly represents the findings of the assessment and makes appropriate recommendations is equally important. Without a solid report, no definitive action can be taken. This process is encouraged by advising the inclusion of clear examples which demonstrate the inappropriate or inadequate behaviour.

Professional attributes such as communication skills can be observed using standardized patients, or actors who have been taught to simulate certain medical conditions and in essence "act out" the role of the patient. These actors can be trained to simulate states of depression, agitation psychiatric disorders, etc. This allows an assessor to observe how the subject physician conducts the interview, demonstrates empathy, makes the patient feel comfortable, and so on. Unprofessional behaviour such as confrontational interviewing, inappropriate language or gestures, etc. will be clearly evident. However, some physicians are able to demonstrate appropriate behaviours in a known test situation, but may not do so in their own practice. This, once again, illustrates how interviewing colleagues, patients, etc. and observing an individual in actual practice is superior to the more artificial "standardized patient" methodology.

Distractors of Performance

An important recent development in the evaluation of physician performance in practice has been the recognition that performance deficiencies cannot always be corrected with

educational interventions alone. Other issues which clearly affect performance, and must be identified and addressed prior to the institution of corrective education are:

- cognitive decline;
- personal illness;
- psychiatric or psychological conditions;
- substance abuse;
- fatigue due to overwork;
- life and family stress; and
- financial crisis, etc.

These distractors to performance are not always evident and it is important that a face-to-face interview be conducted to ascertain whether the physician in question is dealing with any of these issues and requires assistance. It is now believed that many of the early failures of educational intervention in practising physicians may have been caused by the presence of additional distractors which were not identified and addressed.

Assisting physicians with below-standard performance and the existence of detractors is time consuming and emotionally draining for the colleagues involved. However, it is extremely important if we are to return these physicians to practice more confident and better equipped to assist their patients, than they were when we became involved in their professional performance.

Roles of Other Medical Organizations

In Canada, specialists are certified by the RCPSC. Family physicians are usually certified by the CFPC. Although some family physicians still are not certified by the CFPC, as they trained and graduated prior to its establishment, more recently, family medicine has come to be considered a "specialty," and training programs now are geared towards certification by the CFPC. Both the RCPSC and the CFPC administer programs of continuing medical education and practice enhancement. In both of these organizations, continued certification now depends on completion of a specified amount and type of ongoing educational activity. It is inherently believed that such ongoing educational activity will maintain a higher standard of practice performance.

The MCC is instrumental in designing and administering general medical examinations. The MCC Evaluating Examination is designed to be administered to international medical graduates to ascertain whether their knowledge base is at the same level as a graduate from a Canadian medical school. The MCC Part I examination is designed to evaluate suitability at the end of primary medical training to enter postgraduate programs. The MCC Part II examination is administered after approximately 18 months of postgraduate training and encompasses evaluation of knowledge base, as well as, clinical skills using simulated patients and interpretation of laboratory and radiographic information. Professional attributes such as communication skills and ethical considerations are included in the MCC examinations.

CONCLUSION

This paper attempts to provide a beginning in understanding the complex issues and procedures involved in identifying and assisting physicians with performance problems. In addition, it recognizes that physicians who are performing at an acceptable, or high standard, also need recognition and support to continue to perform at these high levels. As programs become more sophisticated and communication improves among jurisdictions who are conducting such projects, it is hoped that the knowledge base will increase and that our ability to assist physicians in today's complex practice environment will improve further. The ultimate success of this endeavour depends on the collaboration among all medical organizations, governments and involved institutions.

APPENDIX A: OVERVIEW OF PROGRAMS TO EVALUATE PHYSICIAN PERFORMANCE IN CANADA

Most jurisdictions in Canada in the past 10 years have established, or further developed, programs to evaluate the performance of physicians following licensure. These programs will be briefly described, province by province, with differences and similarities highlighted. Following the MEPP workshops, all existing programs and new programs evolved a more uniform philosophy for measuring performance.

British Columbia

The Clinical Competence Program (CCP) in British Columbia was established in 1993 to offer a mechanism to practicing family physicians for identifying practice strengths and weaknesses, and for recommending effective and focussed educational remedies.

The goal of the CCP is to present an assessment of competence as a positive process, rather than a punitive process. A detailed analysis of clinical strengths and weaknesses is provided and serves as a basis for directing physicians to appropriate remedial medical education. The CCP's option of "self referral" distinguishes it from programs in other jurisdictions where the referrals are mainly from licensing authorities or involve physicians with previously identified difficulties. The most common route of referral into most other programs in Canada is through a third party, usually the provincial licensing authority.

Approximately 50% of physicians utilizing the CCP program are self-referred. They include physicians who have had health problems, or are returning to practice after leave, have experienced lawsuits and lost confidence or are nearing retirement age and want to see whether they should retire sooner, rather than later. The fee varies from \$750 to \$1500 for British Columbia physicians, depending on circumstances. The revenue generated from tuition fees is minimal, relative to the cost of running the program and would be closer to \$5000 if cost recovery was the goal. This is similar to other programs in Canada.

The assessment process spans two days and utilizes a structured oral examination component of usually 5-7 cases, approximately 15 patient-management problems, 10-13 standardized patients. Multiple choice questions are also utilized. These are obtained from the MCC and are selected by CCP assessors and past participants.

Although the program currently assesses only family physicians, there are plans to expand, to develop tools to assess core competencies expected of specialist physicians. It is recognized that communication skills are an important part of performance and need to be evaluated more explicitly. In addition, skills for rural and remote practice are being addressed.

Alberta

The Physician Achievement Review Program (PAR) in Alberta has been operational for approximately three years. This program is based on a system of questionnaires sent to patients and colleagues of the subject physician. The responses are returned in confidence and analysed for the purpose of informing the subject physician of areas of perceived need.

Although the original intent of the program was simply to provide information to family physicians regarding how their performance is perceived by recipients, a further step has been added allowing those physicians with serious areas of deficiency to be further evaluated and referred for remedial education.

This program has received good acceptance from the profession, following a strong public relations campaign, which was launched by the licensing authority to introduce the purpose and intent of the program to the profession.

The questionnaires are designed to ask questions regarding office management, collegiality, communication skills, psychosocial management, and clinical knowledge and skills.

Saskatchewan

The Practice Enhancement Program (PEP) of Saskatchewan is a joint initiative of the College of Physicians and Surgeons of Saskatchewan and the Saskatchewan Medical Association, initiated in 1994. In 1996, the partnership was joined by Saskatchewan Health. In 1997 a stratified random selection of all family physicians was established for assessment. A program to assess specialists is planned for the year 2000.

The program consists of a pre-visit questionnaire, a patient opinion questionnaire with 60 questions, an office visit by a peer which addresses facilities, standards, quality of records, quality of care and is followed by a discussion of findings. A final report and recommendations are then submitted. A scoring system is utilized as follows:

- Category 1 – consistent, superior performance
- Category 2 – consistent good care, minor concerns, eg. records legibility
- Category 3 - acceptable, but significant need for improvement in areas listed
- Category 4 - immediate cause for concern

Category 3 physicians are requested to make changes to their practice pattern and are followed up in 6-12 months to assess implementation. Category 4 physicians are requested to withdraw from practice to undergo remedial education and may return to practice following a successful re-assessment.

Those physicians requiring remediation are supported with a coordinator who discusses the reasons for the referral, sets goals, establishes a strategy for completion and discusses the method of final assessment.

The program in Saskatchewan does not have the capacity to conduct the global assessment of either family physicians (who are referred to Manitoba) or specialists.

Manitoba

The CAPE (Clinicians Assessment and Professional Enhancement) program has been assessing candidates since 1989. The assessment consists of multiple-choice questions (obtained from the MCC), therapeutics assessment, structured oral interview,

communication skills assessment utilizing standardized patients and psychological assessment of the physician.

Ontario

Ontario currently employs a two-step system for evaluating physicians in practice. The office audit program, called the Peer Assessment Program (PAP), has been in operation for about 20 years. This program sends a peer evaluator to the physician's office to review medical records and to evaluate the office environment. Approximately 400 physicians are evaluated by this method each year.

Those physicians who are determined to have significant concerns during the PAP process are referred to an in-depth clinical assessment. The College of Physicians and Surgeons of Ontario has two programs for this second, "high-stakes" assessment - Physician Review Program (PREP) for a general/family practitioner and Specialties Assessment Program (SAP) for specialists.

Physician Review Program

The PREP program has been in operation with the collaboration with the McMaster University Medical School for approximately 10 years. Funded by the licensing authority, this program evaluates family physicians utilizing multiple choice questions, structured office orals, and standardized patients. Approximately 250 physicians have been assessed to date.

Specialties Assessment Program

Although a newer program, this program for specialists was based on the principles and extensive research conducted to establish the PREP program. It is similarly an "observation-based" program where a peer assessor visits the specified specialist at his/her site of practice and spends several days carefully reviewing all aspects of the practice, including observing technical and surgical skills (eg. attending in the operating room).

Following each of these processes a detailed report is written and the physician is placed in one of six performance categories with Category 1 representing no deficiencies and Category 6 representing the physician with profound deficiencies ("unsafe to practice").

Ontario has a well-established enhancement/remediation program which follows directly from the final report of either PREP or SAP. Physicians are guided through a structured remedial plan which is established in conjunction with the Associate Registrar at the College. They are then re-assessed by the same methods as the original assessment.

It has been recognized that, with over 25,000 registered physicians, a screening program is needed in Ontario to identify those physicians who would most benefit from further assessment and remediation. Dr. Ben Chan of the Institute for Clinical Evaluative Sciences has been involved in the development of a screening program. The proposed model involves the use of administrative data to evaluate quality of care. Please refer to Appendix B for a discussion of this model.

Quebec

In the Province of Quebec, six screening programs using established indicators are in operation to identify physicians who may be at risk of performance problems. These screening programs utilize:

- medical treatment of angina pectoris;
- use of benzodiazepines by the elderly;
- use of NSAIDs by the elderly;
- breast cancer pathology;
- psychiatry; and
- nursing homes.

For those physicians determined to be outside of the usual range in any of these indicators, professional inspection visits are prescribed. Those physicians who continue to appear to be at risk will be asked to come for structured oral interviews (for general/family practitioners) or will be requested to engage in an evaluation training period (for specialists). At all levels physicians are offered individual and group remediation programs with continual feedback.

Newfoundland

Newfoundland boasts a recently established formal assessment program for family physicians. It is closely linked with a remediation/enhancement program which follows from the assessment report generated.

REFERENCES

Kaigas T., Monitoring and Enhancement of Physician Performance (MEPP): A National Initiative, The College of Physicians and Surgeons of Ontario's (CPSO) Members' Dialogue, November 1, 1995.

Kaigas T., Monitoring and Enhancement of Physician Performance (MEPP): A National Initiative *Part II*, CPSO's Members' Dialogue, March 1, 1996.

Kaigas T., Monitoring and Enhancement of Physician Performance (MEPP): A National Initiative *Part III*, CPSO's Members' Dialogue, September 1, 1996.

Hall W., et al. Assessment of Physician Performance in Alberta: The Physician Achievement Review. *Canadian Medical Association Journal* July 13, 1999; 161(1) 52-57.

APPENDIX B: USING ADMINISTRATIVE DATA TO EVALUATE QUALITY OF CARE

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Introduction

The Administrative Data Indicators for Quality of Care Testing (ADIQuaCT) project is a collaboration between the Institute for Clinical Evaluative Sciences (ICES) and the College of Physicians and Surgeons of Ontario (CPSO). This project aims to predict, with acceptable levels of accuracy, the performance in quality of care assessments using administrative data on medical services provided, drugs prescribed, and hospitalizations. Such a predictive model may, in the future, assist the College in targeting its resources for assessing physicians towards those individuals at highest risk for lower quality of care.

The CPSO has been measuring quality of care since 1980. Its Peer Assessment Programme (PAP) consists of a set of instruments for measuring quality of care. Physicians are evaluated by the following means:

- a pre-visit physician questionnaire for obtaining physician demographics;
- a visit by a peer assessor to the office to examine office and lab facilities, use of drugs and sterilization procedures; and
- a review of about 20-30 charts by the peer assessor to assess record keeping and management of common conditions.

The peer assessor then completes a structured assessment form and forwards it to a Quality Assurance Committee, which then assigns physicians a grade, from B1, B2, C1, C1R, C2 to D. The two lowest grades (C2 - records too poor to be assessed, or D - serious concerns about quality of care) are of sufficient concern to require an interview with the Committee. The prevalence of a C2 or D is 13%. Need for an interview is not a failure; more than 75% of physicians graded C2 or D will be practicing satisfactorily after some minor intervention. If the Committee has continuing concerns about quality of care, the physician is assessed further using more detailed instruments and may ultimately be asked to relinquish practice or submit to a remedial education program prior to resuming independent practice.

At present, the CPSO conducts evaluations on all physicians over age 70 and a random sample of those under age 70. There are exclusions for physicians in practice for less than five years, who have been assessed in the last ten years, have no office practice, or are about to retire.

Methods

There were 889 general practitioners/family physicians who were assessed from 1993 to 1997. Using the CPSO registration number as a unique physician identifier, the test scores of these physicians were linked to three administrative databases. The Ontario Health

Insurance Plan (OHIP) physician claims database holds detailed information on the medical services rendered to each patient seen by the physician. The Ontario Drug Benefits Plan (ODBP) database provides information on medications prescribed to those patients over the age of 65 who are eligible for assistance. The Discharge Abstract Database contains data on hospitalizations.

Three focus groups of physicians were conducted to elicit suggestions for markers of poor quality of care (eg. rate of mammography screening). Each focus group included urban and rural physicians, academics and other experts in primary care research. The administrative data sources listed above were used to construct, where possible, indicators representing the suggestions of the focus groups. A pre-requisite to construction of these indicators is a precise definition of the number and type of patients within a physician's practice, given that most of these indicators are expressed as rates of events within the physician's patient population. After testing several options, an algorithm was chosen which assigned any given patient seeking medical care in a given year to a family physician if over 50% of all visits to that physician.

Several methods were used to explore the relationship between indicators of quality of care and test scores. In the interest of brevity, we present results from three models: an ordinal logistic regression, using the six-category grade variable as the dependent variable; and two dichotomous logistic regressions, using two different criteria for pass-fail (C2 or D vs other, and C1,C1R, C2 or D vs other). Observations were weighted to reflect the oversampling in the over 70 year old group. Both forward and backward elimination techniques were attempted to arrive at the most comprehensive set of significant predictors.

Results

The results of the regression analyses are listed in Figures 1a, 1b and 1c. Variables which were not significant included solo practice, school of graduation and foreign graduate status. Utilization of lab services was also not a significant predictor. This finding, however, was probably due to lack of complete data; many labs in the province are funded through a global budget instead of through a fee-for-service system. Admissions for ambulatory-care sensitive conditions such as congestive heart failure or diabetic ketoacidosis were also not significant predictors, probably because the incidence of such hospitalizations within a family physician's practice in any given year is small.

Discussion

This study demonstrates that it is possible to use administrative data to draw inferences about quality of care. The types of factors which predict quality include physician demographics, training, practice volume, drug prescribing habits, and test ordering. Physicians who appear to purposefully engage in more complex arenas of patient care, such as emergency departments and the handling of HIV patients, also appear to have higher test scores.

There are numerous limitations to this approach. First, practice guidelines and the standard of care are continually evolving, and a definition of appropriate care in one time period may not hold in the next. Second, the performance of the model as a predictive tool is dependent on data quality and completeness of the dataset. Some data fields, such as the diagnosis recorded on the patient assessment, are not regularly validated. Approximately 6% of physician service activity is not captured by the fee-for-service system, because the physician is paid by salary or capitation.

Despite these limitations, this approach shows considerable promise as an evaluation tool. Because the cost of conducting an assessment is high (\$1,200) and the yield using a random sampling frame is relatively low, there is great potential to improve the efficiency of the quality assessment process. Further research is being conducted to validate the performance of these regression models in predicting a physician's test score, using a more recent cohort of physicians who have been assessed.

