

Moving Towards an Electronic Patient Record: A Survey to Assess the Needs of Community Family Physicians

Howard R. Strasberg¹, MD, Fred Tudiver¹, MD, Anne M. Holbrook³, MD, PharmD, MSc.,
Glen Geiger², MD, Karim K. Keshavjee³, MD, Sue Troyan³

¹Department of Family and Community Medicine, University of Toronto

²Department of Medicine, University of Toronto

³Centre for Evaluation of Medicines, Department of Medicine, McMaster University

ABSTRACT

Objective: To determine the needs of community family physicians regarding electronic patient records (EPRs). Design: A comprehensive survey was sent to 101 community family physicians in Hamilton, Ontario, who had expressed an interest in EPRs. Results: 46 physicians responded (46%). 87% felt that an EPR would result in their providing better patient care. A wide variety of items were deemed to be important to be included on the EPR "front page". Desired functionality emphasized labs, medications, consultation, hospital follow-up and health maintenance. Family physicians tended to prefer templates to other data entry methods such as typing and dictating. Respondents were more willing to view information from the hospital than to let the hospital view information from their own offices. Conclusion: This survey provided useful information on the perceived EPR needs of community-based family physicians. It will be repeated post-computerization.

INTRODUCTION

Interest in electronic patient records (EPRs) in Family Medicine has been growing. A Medline search using the MeSH strategy "medical record systems, computerized AND (family practice OR primary health care)" yielded 178 citations from January 1966 - October 1997. These papers covered a broad range of topics in EPRs, including attitudes towards computers, advantages of EPRs, descriptions of EPR systems, implementation of EPRs, guidelines, evaluation and research, coding and standards and patient perspectives.

Perceived advantages of EPRs in Family Medicine over paper records include recalls and reminders¹, greater efficiency, quality and accuracy in patient care², multi-user simultaneous access, rapid search and retrieval of patient information, reduced need for filing and copying and quality improvement and integration

with other applications, such as patient education software³. Many of these perceived advantages were also identified in a recent study by Wager, Ornstein and Jenkins of 44 family practices already using a computer-based patient record⁴.

Descriptions of many different ambulatory EPR systems can be found in the literature. The Medical Record (TMR) was designed to be a truly comprehensive personal health record, integrating data from all points of delivery to create a time-oriented database of the health-related course of events in a person's life⁵. The Swedestar system was based on a shared problem-oriented patient record with integrated decision support, and included structured data entry, advanced search and query functions and integrated procedures for quality assurance⁶.

Reports of both successful and unsuccessful implementation of EPR systems have been described. Swanson et al described the successful implementation of EPRs in four family practice residency programs⁷. These systems included chronic and acute problem lists, medication lists, prevention prompts and protocols, laboratory and radiology information, electronic signatures and search capabilities. Lawler, Cacy et al provided an informative account from an academic Family Medicine center of an EPR implementation, followed by its termination three months later, primarily because clinicians found the system too hard to use with little perceived benefit⁸. In a related article they described the need to look beyond the screen when evaluating an EPR system⁹.

Although it is clear from our literature review that interest in EPRs in Family Medicine is significant, we are not aware of a comprehensive study of the needs of family physicians for EPRs. The experience outlined by Lawler, Cacy et al underscores the need to perform such a study prior to dedicating resources to the development

or purchase of an electronic patient record system. The purpose of this study was therefore to determine the needs of community family physicians for an EPR.

METHODS

A comprehensive survey was designed by reviewing material from various sources. Two major sources were the literature review and *The Computer-Based Patient Record* published by the Institute of Medicine¹⁰. We also reviewed a survey that one of our affiliated hospitals had previously conducted to assess the access needs of various departments to various parts of an electronic patient record. Other material came from Medical Informatics conferences, including the American Medical Informatics Association 1997 Fall Symposium, and *Towards an Electronic Patient Record 1997 (TEPR '97)*. Finally, we reviewed a number of vendor systems for additional ideas for items to be included in the survey.

A preliminary draft of the survey was tested for both content and face validity. Content validity was assessed by seeking opinions from four professionals in Medical Informatics: an internist participating in an institution-wide EPR project, an academic family physician, a researcher in health technology, and an information systems consultant for Family Medicine. Face validity was assessed by asking three staff physicians, two nurses and one resident from another Family Medicine academic centre to review the survey for clarity and relevance. These individuals completed a pretest questionnaire, which provided us with feedback about the length of time it took to complete the survey and suggestions for improving the wording and layout. Appropriate changes were made following consultation with the above individuals.

The final survey was sent to 101 community family physicians in Hamilton, Ontario, all of whom had expressed an interest in EPRs. None of the physicians was currently using an EPR, although nearly all submitted billings by computer disk. A modified Dillman method¹¹ was used that included two follow-up phone calls after the initial mailing.

RESULTS

46 surveys were returned for an overall response rate of 46%. We found no significant differences between responders and non-responders when we looked at gender, years since graduation and status of certification by the College of Family

Physicians of Canada. In terms of computer knowledge, 23% said they were novice, 55% said they were intermediate, 15% said they were advanced and 7% said they were expert.

67% felt an electronic patient record system would make their work easier. 87% felt that it would result in providing better patient care.

Perceived Needs for the Content of an EPR

Respondents were asked to rate the degree to which 27 different items were desired to be included on the "front page" of the EPR. [Table 1](#) indicates the top ten items, in descending order of preference, as indicated by the percentage who indicated that each item was desired or strongly desired. Several respondents added in writing that risk factors such as smoking, drug and alcohol use should also be included on the "front page". Fewer than 1/3 of our respondents were interested in such features as next-of-kin, billing category, vital signs, photograph of patient and housing status on the front screen.

Table 1. Percentage of respondents who indicated that each item was desired or strongly desired to be included in the EPR "front page".

Item	Percent Desired
Allergies	100.0
Flag if Abnormal Lab Result not yet reviewed	95.6
Age	93.2
Active Problem List	91.1
Current Medication List	91.1
Notification if screening procedure is recommended at this time	88.9
Dates of last screening procedures	86.7
Flag if Medication List has been changed by another physician	80.0
Immunizations	79.5
Demographic Information	77.8

Respondents were then asked to rate the degree to which 27 different functions were desired to be included as part of the EPR system. [Table 2](#) indicates the top eleven functions, in descending order of preference. In addition, 82.2% of respondents wanted clinical practice guidelines (CPGs) for display only, 64.4% desired CPGs integrated with the EPR and 21.7% wanted to view X-Ray images.

Table 2. Percentage of respondents who indicated that each function was desired or strongly desired to be included as part of the EPR system.

Function	Percent Desired
Maintaining Immunization Log	100.0
Viewing laboratory results	100.0
Keeping a current medication list	97.8
Viewing hospital discharge summaries	95.7
Semi-automated referral letter	93.5
Automated notification of potential drug interactions	93.3
Health prevention screen	93.2
Lifestyle screen to record health habits	88.9
Viewing X-Ray results in reported text form	87.0
Viewing emergency department notes	87.0
Viewing hospital specialty clinic notes	87.0

In terms of research, 82% wanted the ability to create simple customized reports using user friendly tools. 55% indicated that they preferred a coded problem list, 23% indicated that they preferred a free-text problem list, and 23% indicated no preference.

Data Entry

Respondents were asked to rank 7 data entry methods in order of preference. The following were the data entry methods in the survey and in parentheses the number of respondents who ranked each method as either first or second: templates plus dictating additional text (19) (point-and-click templates for various common problems), templates plus typing additional text (17), dictating a note for every visit (13), templates on a hand-held device (12), having the nurse enter the history with templates (8), typing the note directly (7) and having the patient enter the history with templates (3).

63% said they would be most likely to enter data *during* the patient encounter, 33% preferred to do it *immediately after* the patient encounter, and 9% said they would be most likely to enter data at the *end of the clinic*. 85% indicated that they would be willing to enter their own billing diagnostic and visit codes. 48% wanted the ability to schedule follow-up appointments for patients using the computer in the examining room.

Sharing Information: Security & Confidentiality

When asked what parts of records from a hospital's inpatient services should be available

to a family doctor, 31% said the entire hospital record, 47% said the entire hospital record except data specifically identified as particularly sensitive and 22% said that only the hospital discharge summary should be available. No one said that no parts of the hospital record should be available. When asked what parts of the FP (Family Practice) record should be accessible to a hospital's inpatient services, 2% said the entire FP record, 34% said the entire FP record except data specifically identified as particularly sensitive, 59% said only the FP front page (i.e. medications, problem list, etc.), and 5% said that no part of the FP record should be shared. Similar results were found when asked about sharing information between a family doctor and a hospital emergency department and between a family doctor and a specialist.

94% of respondents felt that records should be available to other staff of the FP clinic if they were directly involved with the care of the patient. 91% felt that hospital staff should *not* have access to FP records *except* during the period of time they are directly involved with the care of the patient.

48% **disagreed** that they were concerned others might find out about their practice patterns and habits using an EPR system; another 37% were neutral. 37% **disagreed** that they were concerned others might find out about their billing patterns using an EPR system; another 46% were neutral.

91% agreed that the computer system should keep an audit log of which users access a particular patient's electronic record and when they do so. 91% agreed that the ability to generate reports containing patient identifiable data should be restricted in general, and should be permitted only in specific cases after obtaining approval from a designated person or committee responsible for protecting patient confidentiality.

93% felt that some types of data are particularly sensitive, and require additional levels of security protection. Some of the many examples cited included psychiatric history, sexual history, HIV status, substance abuse and marital counseling. A few respondents said that particularly sensitive data were those as deemed by the patient.

Implementation: Transferring the historical paper data; Training

63% felt that historical test results should be transferred to the electronic patient record by designated support staff. 33% felt that historical

consult reports should be scanned into the electronic patient record. 27% felt that historical progress notes should be scanned into the EPR.

84% felt that a phase-in approach should be used in introducing the EPR; i.e. as more and more EPR functions are added, the paper record would be used less and less. 17% felt that 1-5 hours of training time would be required and 52% felt that 6-10 hours of training would be required. 27% ranked formal training in a computer classroom with an instructor as their preferred training method. 53% preferred one-on-one on-the-job training with an instructor and 16% preferred online computer tutorials.

DISCUSSION

This study is one of the first to examine the perceived needs of community family physicians for electronic patient records.

Although our study looked at desired EPR functions rather than actual functions used, our results were generally similar to a study by Wager, Ornstein and Jenkins⁴ of actual practice patterns. For example, in Wager's study 100% of physicians entered medications, and in our study 97.8% of physicians desired to keep a current medication list. Similarly in their study 88.6% kept a problem list, and in our study 91.1% wanted the problem list on the front screen. However, there were differences — in Wager's study 61.4% entered lab results into the system; in our study 100% wanted to view lab results. In our study 93.2% wanted a health maintenance screen; in Wager's study 52.3% entered health maintenance data. The smaller percentages in Wager's study may be explained by the physicians actually having to enter the lab results and health maintenance data, compared to just viewing them. It is clear that the medication list, the problem list, lab results and health maintenance data are considered critical parts of the EPR.

Over 80% of respondents desired access to practice guidelines in display format. Although the details of how guidelines would be integrated with the EPR were not clarified, 2/3 of respondents also desired access to guidelines in this more complex form.

Only 21.7% of physicians wanted to view the X-Ray images. Physicians may have concerns about having the responsibility to interpret the image before it is seen by the radiologist, or about the image resolution and quality.

General support was indicated among these community physicians for doing research with the data. 55% favoured a coded problem list, although 23% did not know whether they preferred a coded or free-text problem list. This relatively large percentage of unknowns may reflect a lack of education about EPRs.

One of the key barriers to successful implementation of an EPR system is data entry. The benefits of obtaining data from the system can only be derived if users are willing to enter data. There was a preference for some form of templates over other mechanisms of data entry such as typing and dictating. Thus, designers of EPR systems for Family Practice should consider including templates as part of the package.

In our study 63% indicated that they would be likely to enter data during the patient encounter, compared to the Wager study where only 27% of physicians entered 90% of patient information at the point of care. The respondents in Wager's study may have been influenced by the particular software in use at the study clinics, which may have made data entry at the point of care more difficult than other types of software.

In our study most respondents felt that at least some information should be shared between family doctors and the hospital in both directions. In general our respondents wanted to see the entire patient record from the hospital, but were less willing to let the hospital see the entire patient record from their Family Medicine offices. Our respondents may have felt that while certain information discussed with the family doctor may not be relevant to the hospital, all information from the hospital may be relevant for the family doctor as primary care provider. Given the long list of examples of data thought to require additional security, it would be difficult to determine *a priori* which items should have more restricted access to another provider at any given time. A number of respondents felt that a possible solution would be full access *except* to those items identified *by the patient* as particularly sensitive. Respondents also supported the use of an audit log, which is consistent with the requirements of the College of Physicians and Surgeons of Ontario for EPRs.

Our respondents favoured a gradual introduction to the EPR. Time must be allotted for training; our respondents preferred on-the-job training to classroom training or online tutorials.

A limitation of our study is that we studied self-selected community family physicians in one region who had expressed an interest in EPRs. We do not know if the findings are generalizable to community family physicians without a specific interest in EPRs, or to those from other regions.

A second limitation of our study is that we used a survey to find out about user's needs before the users had used an EPR. Their knowledge about electronic patient records may be limited, and their needs may be different once they actually see and start to use a system. For example, a higher proportion of respondents in our study felt they would enter data during the patient encounter than the proportion who actually did so in Wager's study. Cimino and Socratous¹² found that their attempts at prospective system development had been mixed, in that some of the features requested by the users were used very little once they were implemented, whereas others were used substantially. Recognizing this limitation, we view our prospective needs assessment as a starting point for system design and implementation. We expect that as users begin to use the system, we will have to make changes to the system design. A repeat administration of the survey at some time after EPR implementation would therefore be useful. Additional surveys in other groups of physicians are ongoing. These surveys will enhance the generalizability of our results.

CONCLUSION

Family physicians in the community feel that an electronic patient record system would result in their providing improved patient care. We have identified which items deemed, pre-computerization, to be most important to be included on the EPR "front page" as well as which functions are deemed to be most important to include in the EPR system. Family physicians tend to prefer templates to other data entry methods such as typing and dictating. Family physicians are willing to share some patient information with the hospital, but overall have a greater desire to view information from the hospital than to let the hospital view information from their own offices. A phase-in approach to the introduction of the electronic patient record is desired, together with appropriate training. This survey provided useful information on the perceived EPR needs of community-based family physicians.

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