Electronic Health Records—A Functional Comparison

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Introduction

In response to the growing interest in electronic health records (EHRs) among its membership, the Washington Academy of Family Physicians (WAFP) in May 2003 established a task force "to evaluate and facilitate delivery of current EHR technology to Family Physicians in Washington State." The task force has identified a need for information on the comparative capabilities of EHR products to assist family physicians in EHR product selection. To address that need, this article reports on a recent WAFP survey regarding EHR use among its members, and summarizes the functional capabilities (FCs) of the EHRs found in that survey to be in most common use.

The survey, sent in mid-2003 to 1,992 WAFP members, asked whether the members were using an EHR. If so, they were asked to identify the EHR product and to answer the question "How would you rate the system?" on a 1-5 scale, 5 being most favorable. Of 948 respondents, 360 reported use of an EHR; use of 29 different EHRs was reported.

We undertook to compare the FCs of the five EHRs in most common use. The determination of FCs for each of these EHRs was made by the author in consultation with experienced users of each system and, when necessary, representatives of the system vendors. The list of FCs to be tabulated was based on published recommendations from the American Academy of Family Physicians (AAFP) and the Institute of Medicine (1, 2), as well as the author's own judgment.

During the preparation of this report, the AAFP announced the Principled Group Purchasing Agreement (PGPA), an agreement between the AAFP and information technology (IT) vendors, including EHR vendors. This initiative will provide new options for family physicians to evaluate and purchase EHRs. This article includes a discussion of the PGPA and its implications for family physicians in Washington.

Results

The five EHRs in most common use by our survey respondents, along with the average ratings, are listed in Table 1. The FCs we used to evaluate each EHR are listed in Table 2. We found that all five EHRs evaluated have most of the FCs listed. Thus, we will mention some general findings, then list, for each EHR, the FCs it does **not** incorporate.

All the EHRs with medication formulary capability, with the exception of Chart Connect, offer the option of maintaining this manually or purchasing a 3rd-party database, regularly updated, that includes the medication formularies of most health plans in the United States.

All five EHRs allow clinical staff to access the EHR remotely, i.e. from outside the office. With the exception of Chart Connect, which users access with a standard web browser, this is achieved using a "thin-client" application which connects a computer outside the practice to the "server" computer within the practice. This allows the remote user to access the software as if he or she were at a computer in the office; unlike a web-based connection, thin-client access requires special software to be installed on the remote computer. Some EHRs also allow view-only access to the patient record through a web browser but requires purchase of a separate software application (see below).

While all but two EHRs had some clinical decision-support functionality, which the client can configure according to his or her preference, Centricity allows the incorporation of a 3rd-party product to "plug in" evidence-based clinical rules to drive the alerts and reminders within the EHR (provided by Clinical Content Consultants, LLC).

Aggregate reporting is available with all the EHRs evaluated, but is integrated into the main EHR interface to varying degrees. With Centricity and Practice Partner, simple reports can be generated from the EHR application itself; more complex reports require use of special reporting software. EpicCare allows simple aggregate reports to be generated by personnel with access to the system administrator functions of the software; this is done through a text-based interface rather than the graphical user interface of the main application. More complex reports require use of special reporting software.

EpicCare: Allows web-based access by clinical staff and patients to the EHR (each through a different product purchased separately from the EHR). Sharing of note templates among different practices is technically challenging.

Practice Partner: Does not include overdue results alerts. Allows web-based access by clinical staff and patients to the EHR (each through a different product purchased separately from the EHR).

Centricity: Does not include web-based access by the patient.

Chart Connect: Does not include drug-drug interaction alerts or web-based access by the patient. Aggregate reporting is available upon request from the vendor, who maintains the database.

Misys: Does not include clinical decision support, overdue results alerts, medication formulary capability, interfaces with practice management software other than that produced by Misys, or web-based access by the patient.

Conclusion

This article is intended as a point of departure for family physicians exploring EHRs for their practice, rather than a "buyer's guide." It is important, in this process, to consider features and functionalities at a much greater level of detail than what we have presented here. In addition, FCs are only one factor to consider in choosing an EHR. Among the other issues to consider are whether the software is easy to use, whether the data storage is reliable and secure, the performance of the vendor in enhancing and upgrading their software and providing customer support, and the long-term financial stability of the vendor. The following sources provide valuable information about these issues:

- The AAFP's "FPNet" website, at: http://www.aafp.org/x432.xml
- The California HealthCare Foundation's October 2003 guide "Electronic Medical Records: A Buyer's Guide for Small Physician Practices," at: www.chcf.org/documents/ihealth/ForresterEMRBuyersGuideRevise.pdf

Epilogue: The PGPA

The PGPA, announced on November 12, 2003, includes specific agreements the AAFP has reached with IT vendors for special pricing of IT solutions, including EHRs, for AAFP members. It also encompasses a general strategy for the AAFP's interactions with IT vendors, based on the four principles of "affordability,"

Company	EHR Product Name	Number Of Respondents Using	Average Rating (out of possible score of 5)	KLAS Rating**
Epic	EpicCare	124	3.95	7.93
PMSI	Practice Partner	50	3.90	7.04
GE Medical Systems	Centricity Physician Office EMR*	36	4.24	7.40
FiveK	Chart Connect	19	3.98	Not rated
Misys	Misys EMR	15	3.21	6.75

*Table 1. Most commonly used EHRs by WAFP members in 2003 survey, with average overall ratings. *—Formerly known as "Logician." **—Based on the results of user surveys performed by KLAS Enterprises, Orem, Utah. The rating represents the average score, on a 0-9 scale, of 28 different characteristics of the company and its products, such as "product works as promoted" and "quality of documentation." Used by permission.*

"compatibility" (referring to the ability to adopt new products from the same vendor, or different vendors, without completely replacing an information system), "interoperability" (referring to the ability of different applications to exchange data), and "data stewardship" (referring to the need to prevent misuse of patient data). The AAFP hopes, through this strategy, to influence the development of EHR systems so that they better meet the needs of family physicians and the patients they serve. At present, the EHR vendors participating in the PGPA are A4 Health Systems, GE Medical Systems, Medplexus, NextGen, and PMSI. Further information about the PGPA, with links to the websites of these vendors and pricing information for their products, is available at: http://www.aafp.org/x24919.xml .

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Common Functional Capabilities (FCs) of EHRs.

We determined, for each of the five most commonly used EHRs, which of these FCs were met.

- Allows creation and sharing of note "templates" to speed documentation.
- Provider Order-Entry
- Electronic prescribing with drug-drug and drug-allergy interaction alerts
- Maintenance of non-encounter-based patient information (Problem list, surgical history, social history, etc.)
- Medication- and immunization-administration records
- Results review (through an electronic "Inbox")· Longitudinal display of patient information in spreadsheet-like format (e.g. vital signs, lab results)
- Remote access to EHR through a web-based interface
- Incorporation of images of scanned paper documents into patient record
- Allows messaging between users within a practice.
- Clinical decision support (e.g. alerts and reminders based on patient data and evidence-based care guidelines)
- Overdue results alerts ("tickler" alerts when results are not received a given amount of time after an order is placed)
- Medication formulary capability (alert provider when prescribing a non-formulary medication)
- Aggregate reporting (e.g. to build lists of patients with a given diagnosis or on a given medication)
- Allow access by patient to portions of their medical record through a secure web-based interface
- Capable of being interfaced with common laboratory and radiology information systems
- Capable of being integrated with practice management software (billing, scheduling, etc.)

References

1. American Academy of Family Physicians, Future of Family Medicine Task Force One. Final Report, 2003.
2. Institute of Medicine Committee on Data Standards for Patient Safety. Key Capabilities of an Electronic Health Record System. National academies Press: Washington, 2003. *At the time of publication this document was available free of charge on the World Wide Web at:* http://www.nap.edu/html/ehr/NI000427.pdf

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