

The Use of Electronic Health Records in Optimizing the Delivery of Colorectal Cancer Screening in Primary Care

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I Introduction

With the passage of the federal American Reinvestment and Recovery Act (ARRA) in early 2009, the development of an electronic infrastructure for the practice of medicine received a new and impressive level of national commitment. According to the language of the bill, every ambulatory medical practice in the country will need to have an electronic health record (EHR) within several years or face a decline in Medicare payments. Funds are provided in the form of monetary incentives to assist practitioners to reach that goal. Direct financial incentives to physicians are a bold step to drive the country to fully functional electronic medical information systems in a relatively short period of time. After 40 years of development of health information technology, the country's leadership has signaled that it is time to go from a low rate of uptake of EHRs in outpatient medicine to a complete transformation of the way information is stored, shared, and transferred within the world of ambulatory care.

What is the significance of this for cancer screening in general? What is the significance for colorectal cancer (CRC) screening? New approaches are needed in order to fit all the recommended screening measures, including cancer screening, into primary care practice. Electronic health records are a leading candidate to help with this task. Better use of non-physician staff members within a practice is another approach. The combination of these two may be complementary.

This section of the Toolbox and Guide focuses on electronic health records and whether they can make a beneficial difference for cancer screening, specifically for CRC screening. General considerations will be addressed for doctors planning to implement their own systems. The sources of help available to address them are provided. A list of electronic health record features that are needed to improve the delivery of CRC screening is included. Most of the features will be applicable to cancer screening in general. This section is designed to be helpful to both the doctor who already has an electronic medical record and one who is just beginning to consider buying one.

II Background

Benefits of Electronic Medical Records. Some of the best arguments for the widespread use of health information technology grow from an understanding of the potential they have to affect the work process and work flow. This perspective that connects the impact of the technology to the work of providing medical care is key to an understanding of its benefit. Whether it is the entire breadth of the work of medical practice or cancer screening only, or colorectal cancer screening only, there are more opportunities for data entry, data sharing, and simultaneous communication. This rapid pace storage, transfer, and delivery of information is the essential core of the EHR advantage.

Limited Uptake and Current Incentives. Given that it is more than four decades after innovators demonstrated the feasibility of EHRs, the current penetration of EHRs into ambulatory medical practice is surprisingly low. The results of a recent national survey conducted in 2007-08 and published in the *New England Journal of Medicine* revealed that 4% of physicians had an

“extensive, fully functional electronic-records system” and 13% had a basic system. The respondents were slightly weighted toward specialty physicians (52%) as opposed to primary care physicians (48%).¹ It is believed that the slow uptake is explained by the financial barrier to purchase and implementation of a system.

If it is true that finances have been the limiting factor, the incentives that are now embedded in federal policy should have a significant impact. The incentives are substantial. An unprecedented \$19 billion was authorized for Health Information Technology (HIT), \$17 billion of it as incentives to individual physicians for the adoption of EHRs. Another \$2 billion is allocated to help build the country’s infrastructure for this development. The incentives are offered in conjunction with the delivery of Medicaid and Medicare services. The Medicare incentives for office-based practitioners are enough to make a significant difference to a practice. Physicians who "meaningfully use" an approved HIT system beginning in 2011 or 2012 are eligible to receive as much as 75 percent of their Medicare allowed charges as an HIT incentive, up to the maximum incentive payment of \$18,000 for the first year. Bonuses remain available but decline in stepwise fashion over the subsequent three years and are phased out after 2015. Those who implement their system by 2011, are eligible for maximum bonuses of \$44,000 over five years. Payments go to the physician, not the practice.² Physicians who practice in health professional shortage areas are eligible for additional incentives. Medicaid will also offer incentives, but these will go only to physicians who see at least 30% Medicaid patients. They are eligible for assistance with purchase, installation, and maintenance of a system over five years up to a total of about \$55,000. Physicians who already have EHRs can also qualify, as long as their systems are certified according to standards that will be developed by the Department of Health and Human Services. The new policy enacted in ARRA includes penalties as well as incentives. Physicians who fail to adopt EHRs will face lower Medicare payments. Over several years, their payments will decline until they receive only 95% of what they would otherwise have been paid. The direct use of financial incentives and penalties might not have been acceptable only a few years ago.

Will EHRs solve the problems of the ambulatory delivery system? Will they facilitate higher rates of screening for cancer? How do we know that EHRs will contribute to a better run system that produces better outcomes? Many prominent medical associations are in support of this national policy. Yet some remain skeptical. What does the evidence show? Much has been written about the capabilities of EHRs in the last couple of decades. The evidence does show significant potential. But reports about practice groups or health systems like the Veterans system or Kaiser are not the same thing as a system-wide change. Significant hurdles need to be cleared in order for this huge investment to bear fruit and produce the hoped for impact on the delivery system.

Views of the Medical Community and the Patient Centered Medical Home. The medical community in its organized form is largely in support of the widespread use of computer technology to manage, store, and transfer information. The complexity of medical practice, the fragmentation of the wide array of medical services, and the cumbersome nature of the reimbursement system are convincing reasons to employ a technology that reduces the burden of paperwork and has an immense capacity to organize and process information. The American Academy of Family Physicians (AAFP) has been in support for a number of years. Their policy says that the Academy “.... believes that every family physician should use information

technology that includes electronic health records with the ability to access and communicate needed clinical information to achieve high-quality, safe and affordable health care.” This statement was approved by the Board of Directors in March 2001 and updated in 2007.

The medical organizations in the Patient-Centered Primary Care Collaborative (PCPCC) that formulated the six tenets of the Patient Centered Medical Home (PCMH) in 2007 included clear emphasis on the importance of health information technology. This is embedded within three of the six principles of a patient centered medical home.³ These are bulleted below.

- Principle: Coordination of care. This objective is facilitated by registries, information technology, and health information exchange.
- Principle: Quality and safety. This objective encompasses information technology. The text states that, “Information technology is utilized appropriately to support optimal patient care, performance measurement, patient education, and enhanced communication.”
- Principle: Payment. This objective means “payment that recognizes” the value to patients that comes from the patient centered medical home. This payment should support adoption and use of health information technology for quality improvement. It should also support provision of enhanced communication access such as secure e-mail and telephone consultation.

III Getting Down to Brass Tacks

Advice for New Users of Electronic Medical Records. For new users or purchasers of EHR systems, the prospect of selecting, installing, and maintaining such a system can be substantial. Fortunately, there are a growing number of resources available to assist with these tasks. A recent book published by the American College of Physicians (ACP) is extraordinarily useful as a guide to new prospective purchasers.⁴ The ACP website (www.acponline.org/running_practice/technology/ehr/) also has a “Roadmap to Successful EHR Adoption” that is helpful for physicians at varying stages of EHR implementation.

The AAFP Center for Health Information Technology website (www.centerforhit.org) has many resource links for primary care physicians. Specific links are available for physicians who are in different stages of purchasing an EHR system. The AAFP website also has links for EHR CME opportunities, pricing information, health information technology (HIT) organizations, and other helpful information. Table 1 provides a side-by-side list of the guidance topics offered by these two excellent sources.

The AAFP journal Family Practice Management published the results of a 2007 satisfaction survey of 422 family physicians who use different EHR systems. The authors summarized the responses on the 13 most commonly used EHRs systems.⁵ The article offers tables comparing the systems on functionality, ease of use, support, system cost, interoperability, security, and overall satisfaction.

Table 1: AAFP e -Center for Health Information Technology * & ACP Reference Book on EHR's **

<u>American Academy of Family Physicians</u>	<u>American College of Physicians</u>
<ul style="list-style-type: none"> • Step 1: Preparation <ul style="list-style-type: none"> – EHR Email Discussion List (Members only) – Find a Doctor Like Me in a Practice Like Mine (Members Only) – Introduction to Electronic Health Records – Understanding Features and Functions – Free and Open Source Software – Implementation 101 – Things to Think About Before you Start • Step 2: Selection <ul style="list-style-type: none"> – Physician Product Reviewer (Members Only) – Understanding EHR Contracting and Pricing – How to Select the Right EHR for your Practice – Readiness Assessment (Members Only) • Step 3: Implementation <ul style="list-style-type: none"> – Understanding Features and Functions – Hardware 101 – The Basics – Implementation Tutorials – It Can Be Done – Seven Successful Implementations • Step 4: Maintenance <ul style="list-style-type: none"> – Peer Community – Events 	<ul style="list-style-type: none"> • Step 1: Preparation <ul style="list-style-type: none"> – Understanding Business Processes in Clinical Practice <ul style="list-style-type: none"> • Business process management: billing, registration, scheduling • Clinical information features: Ease of data entry, display, interfaces, etc. – Integration of Clinical and Business Processes – Understanding Clinical Processes: review of clinical documents, orders, encounters, eprescribing, decision support, disease management, reports, etc. • Step 2: Selection <ul style="list-style-type: none"> – Starting the Selection Process – How to Use Consultants Effectively – Evaluation of Product Features – Vendor Evaluation – Creating a Request for Proposal and Negotiating a Contract – Site Visits and Demonstrations • Step 3: Implementation <ul style="list-style-type: none"> – Planning your Implementation – Project Management – Work Flow – Going Live: Training Data Migration, and Interfaces • HIPAA and Security

* American Academy of Family Physicians website www.centerforhit.org

** Electronic Health Records: A Guide for Clinicians and Administrators. Jerome H. Carter editor. American College of Physicians.

Advantages of the EHR. For the physician who is tracking the mandate toward computerization, and does not yet own a system, the new developments may be perplexing. For those physicians who are starting on this journey, and those who are already well down the road, it helps to remember the time saving advantages of a computerized office system.⁴ EHRs offer many functions that are embedded in the system that save time and effort. These features are listed in Table 2.

Table 2: Advantages of Electronic Health Records

Typical Office Function	Tasks Eliminated	Advantage (saves time, money, risk, accuracy)
Legible chart notes	Transcription	Money
Chart use	Chart pulls	6 min. per chart
Prescriptions refills	Chart pulls, writing prescriptions	15 min. each patient
Coding of diagnoses	Code look-up	4 codes per min.
Receiving Lab results	Receiving, distributing, filing on chart	20 lab results per hour
Issuing Referrals	Writing a referral, possibly selecting a specialist	7 min per referral
Quality reporting	Generating reports via chart audit or claims data	20-25 charts per hour
Drug recalls	Identifying manually patients who are on a specific drugs	Risk of adverse drug effects
Hospital admissions and discharges	Written summaries with lists of diagnoses and medications	Improves accuracy, saves time

Use by Practice Staff. Since EHRs provide administrative and supervisory functions as well as clinical functions, they will be utilized for data entry and data access by multiple individuals in the practice. Clerical personnel, receptionists, nurses, medical technicians, lab personnel, and physicians may all enter and benefit from data in the electronic record. Data entry, information sharing, task sharing, interaction with patients, and auditing of outcomes are functions that involve multiple staff of the practice.

Timeline. The acquisition and establishment of a new practice-wide system will not happen overnight. It usually takes over a year to complete the steps that are required. A typical timeline for selecting and installing a system follows.

Preparation and Purchasing:	
“Set goals and objectives	(1 mo)
Practice analysis:	
Process identification	(1 mo)
Process analysis	(2-3 mo)
Requirements Specification	(1 mo)
Product evaluation	(1-2 mo)
Vendor analysis	(1 mo)
Create and submit Request for Proposal (RFP)	(1-2 mo)
Contract negotiation	(1 mo)
Implementation:	
Workflow analysis and matching to ER	(1-2 mo)
Re-engineering	(1-2 mo)
Hardware/Software Installation and Testing	(1 mo)
Training	(1 wk)
Go-live until normal patient flow returns	(2-3 mo)
Total Time	14-17 months

IV EHR Rating Systems and Knowing Your Needs

Several organizations have published ratings for the various available EHR systems. One of the most prominent is the Certification Commission for Healthcare Information Technology (CCHIT). Traditionally, the EHR vendors created systems that conformed to proprietary database formats, making it difficult for them to send and receive data from other competing products. The medical informatics community realized the need for interoperability and created standards for data communication.

CCHIT was founded in 2004 as a private, non-profit organization that certifies EHRs, based on a set of requirements for functionality, interoperability and security. Over 400 criteria have been listed. CCHIT certification programs exist for Ambulatory EHRs, and it is possible to get additional Ambulatory certifications for Child Health and Cardiovascular Medicine. Criteria are available online at www.cchit.org/certify/ambulatory/index.asp. The functionality criteria include numerous items that relate to cancer prevention and screening, including data collection, clinician prompting, documentation, reporting, test ordering, as well as others. An EHR system must meet all of the criteria to be fully certified by CCHIT. CCHIT has fully or partially certified over 200 EHR products. CCHIT is currently developing a second level of certification that will only address the criteria needed to be eligible for the ARRA payment incentives.

CCHIT is not the only organization that is doing evaluation of systems. A list of reputable organizations that provide ratings can be found in Table 3. A few of the sites require membership (AAFP and ACP) or charge a fee to access their information. An Email discussion List serve is available through the AAFP.

While CCHIT certification has gained momentum, there are some criteria that are not evaluated by CCHIT. This includes ease of use of EHR software products, financial viability of the company offering the software, and the quality of software support. Providers need to look beyond CCHIT to assess EHRs in these categories. Fortunately, several organizations have created ratings systems to help providers with their purchasing decisions.

Table 3: Reliable Sources of EHR Ratings

Source of HER Ratings	Type of Access Available	Website
CCHIT	Free Public Access	www.cchit.org
AAFP	Membership required for selected links	www.centerforhit.org
AC Group	Purchasable reports	www.acgroup.com
ACP	Membership required for selected links	www.acponline.org/erhpartners
KLAS	Purchasable reports	www.klasresearch.com/EHR_software
CTS Guides	Registration required	www.ctsguides.com/practicepartner.asp

When deciding to purchase an EHR, providers should prepare a Request for Proposal (RFP) to be submitted to selected EHR vendors. Basic information about the provider’s practice should be included, such as practice size and location, current practice management system, current computer hardware, and current network information. The RFP should request Vendor information, including company history, financial statements, and a list of all current EHR users similar to the provider’s size and type. The RFP should include the provider’s desired overall EHR functionality.⁶ Vendors must be prepared to provide a full demonstration. Additionally, PCPs should get a list of similar practices that have purchased an EHR from the Vendor as a reference, and a select number of the practices should be contacted. The Doctors’ Office Quality- Information Technology (DOQ-IT) Project has developed a set of “contracting guidelines” with EHR vendors that is helpful when negotiating the details of a final arrangement with the vendor. (healthit.ahrq.gov)

V Optimizing CRC Screening Performance Using the EHR

CRC screening in primary care can be a complex process, as it often requires several steps and the involvement of non-primary care providers. For stool blood testing, results need to be tracked and abnormal results need to be followed. As fecal occult or immunochemical testing needs to be performed annually per guidelines, a reliable reminder system for the provider and the patient is key. For colonoscopy or other endoscopy screening, referrals need to be generated,

results need to be tracked, and results reporting/follow-up recommendations need to be easily accessible in the record.

Risk assessment using the EHR can also be improved. For example, while family history is an important component of CRC risk assessment and screening protocol, EHRs have not traditionally documented family history information in an efficient manner. Fortunately, the Department of Health and Human Services has developed a tool that uses widely accepted standards for family history information. The online tool, called My Family Health Portrait, allows the patient to collect information in a standard way that is easy for family members to share and for providers to use. It can be accessed at www.familyhistory.hhs.gov, and has the potential to be shared electronically with EHRs and personalized health record systems. Vendors should be asked about the potential to interface with this tool.

The EHR provides multiple tools that can be tremendously helpful in maximizing screening performance. A few general principles can help guide the clinician in understanding how to optimize CRC screening using the EHR:

- Results need to be documented using searchable data fields, which should include the date of screening performance. The results cannot simply be documented in the visit note. Ideally, the data, once entered, will automatically populate a health maintenance flow sheet that is prominently located in the EHR.
- EHRs are only as good as the data that are entered. If the screening results are not entered automatically from a lab (FOBT/FIT) or endoscopy report, non-provider staff can be especially helpful in entering data during the office visit. Medical assistants can be trained to find and enter the screening results as part of the patient check-in process.
- Interfacing with other providers is critical, particularly when colonoscopy is the mode of screening. EHRs must have the capacity to receive results from other EHR systems, using searchable data fields. Having a results letter scanned in the EHR will not suffice. For this reason, providers should be wary of purchasing a stand-alone EHR system.
- Clinicians should be able to identify patients needing to be screened both at the point of care and as part of quality reports that can be generated. Clinicians need to inquire about the level of system support that is required to generate these reports. Many EHRs include this function as part of their basic criteria (CCHIT certified systems do require this), but some require vendor support to accomplish this task.

When trying to optimize colorectal cancer screening performance, certain functional criteria should be included in the RFP. A list of these criteria is in the Table 4. All of the criteria listed are also included in the CCHIT 2009 Ambulatory criteria, so any system with CCHIT certification should have the functionality to maximize CRC screening.

Table 4: EHR Capabilities that Facilitate CRC Screening

The system should be able to:

- Capture relevant personal and family history that allows for risk assessment
- Provide access to screening protocol and guideline documents
- Establish provider alerts to screen at point of care
 - Allow provider to modify screening plan based on patient specific clinical situation
 - Identify why there is variation from the guideline (e.g. patient refusal)
- Order screening tests electronically
- View status information for ordered service
- Generate patient educational materials and screening instructions ideally in patient's preferred language
- Create referrals (endoscopy) with details adequate for correct routing
- Receive, store and display lab, imaging or text-based results, using searchable items and dates (interoperable reporting)
- Generate results reporting to patients
- Prompt provider on abnormal results
- Generate reminder to patients if screening is overdue
- Generate audit/feedback reports that can be practice and provider specific
 - Reports should be tailored to specific parameters (e.g. screened, unscreened, specific testing, etc.)

VI Non-EHR Electronic Supports for Cancer Screening

Clinician Decision Support Aids. Electronic clinical decision support systems (CDSS) are becoming increasingly available to primary care clinicians. While there is considerable variability among the CDSS, evidence seems to indicate that they can be effective in improving clinical outcomes.^{7,8} The Agency for Healthcare Research and Quality (AHRQ) has developed new tools to the electronic Preventive Services Selector (ePSS). Based on the US Preventive Services Task Force guidelines, the ePSS provides personalized preventive services recommendations. They can be downloaded electronically to the clinicians' Blackberry, Palm OS, Windows Mobile, and through the Web (via www.epss.ahrq.gov). The materials are printable, so can be made accessible to the patient at point of care.

Patient Decision Support Aids. Literature on electronic decision aids suggests that they can increase screening rates. However, there are many factors that may work in their favor--or against it. To date, no single approach has been tested in a way that offers generalizable results. While there is no clear path or clear conclusion on the application of decision aids or the best way to make them work, research is continuing on this area of investigation.

Emails within Medical Practice. Advancements in electronic communication have swept the globe, impacting all arenas of commerce including the healthcare industry. The Institute of Medicine promotes the exchange of emails between physicians and patients, stating that a two minute email can address the needs of many patients at a lower cost compared to a traditional office visit.⁹ However, potential disadvantages also exist, and these include the widening of social disparities, inability to examine patients, lack of emotive cues, a possible increase in the risk of diagnostic error, threats to patient privacy, overwhelming physicians by the sheer quantity of emails, and a possible slow response to an email in the presence of an emergency.¹⁰ A randomized controlled trial investigating the effectiveness of emails compared to postal reminders for mammogram screenings found that there was no significant difference between the two modes of communication with regards to the percent of women screened.¹¹ Thus, whether or not to provide email communication to patients will ultimately be the physician's decision

Personal Health Records. According to the Department of Health and Human Services a personal health record (PHR) is a confidential, easy-to-use tool that allows a patient to manage information about their health, including their medical conditions, allergies, medications, and their doctor and hospital visits. All of this data is stored in one place. The patient may decide who is privy to the information and who is not. (www.Medicare.gov) There are many web-based personal health records available to the public including Google Health, WebMD, Lifenline, Synchart and PassportMD. In Google Health, a patient builds a profile based on their gender, age, height, weight, race, medications, allergies and other medical parameters. The patient then has access to vaccination guidelines, risk calculators (provided by the American Heart Association), and an abundance of health information. The potential benefits of PHRs include patient empowerment, improved patient security, enhanced health information privacy and stronger physician-patient relationships.¹² A 2008 study analyzed the early experiences three practices had with PHRs and found that PHRs can enhance the delivery of healthcare, but

require attention to security, privacy, data stewardship and personal control.¹³ Another study looked at PHRs and EHRs, and came to the conclusion that practices with EHRs are more likely to be aware and involved with PHRs, however overall physician awareness and involvement with PHRs remains low.¹⁴ Currently, initiatives are in place to develop systems which integrate PHRs with EHRs with the hopes of improving the quality of care patients receive.

VII Conclusion

With the passage of the federal American Reinvestment and Recovery Act (ARRA) in early 2009, the development of an electronic infrastructure for the practice of medicine received a new and impressive level of national commitment. The medical community in its organized form is largely in support of the widespread use of computer technology to manage, store, and transfer information. What is the significance of this for cancer screening, and for colorectal cancer (CRC) screening? This section of the Toolbox and Guide focuses on electronic health records and whether they can make a beneficial difference for cancer screening in general, and specifically for CRC screening. We have focused on the advantages of EHRs, provided advice for new users of electronic medical records, and identified important capabilities for optimizing CRC screening performance within EHR systems. Non-EHR electronic supports, such as hand held devices, web-based personal health records, and other electronic solutions have also been explored. These subjects will continue to be of high relevance to practicing physicians as the health system evolves.

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