

ELECTRONIC MEDICAL RECORDS

PATIENT SAFETY & RISK MANAGEMENT

GUIDE

An addition to the Physician Office Practice Toolkit

Princeton Insurance

PARTNERSHIP. PREVENTION. PROTECTION.

ACKNOWLEDGEMENT

This Electronic Medical Records Patient Safety & Risk Management Guide was created with assistance from individuals not employed by Princeton Insurance, and without whom completion of this guide would have been difficult.

We wish to extend a special thank you to those whose expertise and assistance were indispensable in compiling this guide. We value your time and input. Thank you to *EMR Vendors* William Rideout and Paul Edge of Misys, PLC; Ken Rosen of eClinical Works, Inc.; Eugene Simpson, MD of McKesson Provider Technologies; Patrick Burton and Charles Jarvis of NextGen Healthcare Information Systems, Inc.; and Thomas Cooke and Diane Bradley, MD of Eclipsys; *EMR Users* Robert Murry, MD, Robert Coates, MD, and Jeff Weinstein of Hunterdon Healthcare Partners, Hunterdon, NJ; Howard J. Gross, MD and Suzanne Bruno of Horizon Eye Care, Margate, NJ; Michael Schleider, MD and Cheryl Hodges of FSA Hematology-Oncology Associates at the Englewood Hospital and Medical Center, Englewood, NJ; Salvatore Volpe, MD, Board Certified Pediatrician, Internist and Geriatrician, Staten Island, NY; and Ronald M. Frank, MD of Ronald M. Frank MDPA, Green Brook, NJ; *Defense Attorneys* David Bishop, Esq. of Crammer, Bishop, Marczyk & O'Brien, Absecon, NJ; Michael Keating, Esq. of Dughi & Hewit, PC, Cranford, NJ; and William Theroux, Esq. of Buckley and Theroux, Princeton, NJ; and *Consultant* James B. Couch, MD, JD, FACPE, Managing Partner and Chief Medical Officer of Patient Safety Solutions, LLC.

We extend an additional thanks to EMR Vendors for authorizing the use of the EMR screen shots used in this guide.

IMPORTANT NOTICE

Notwithstanding the foregoing acknowledgment, any errors, omissions or oversights are solely the responsibility of Princeton Insurance Company.

This user guide is not intended to provide professional advice of any kind, including medical or legal advice. It has been written to inform and provide information about an important and evolving field in the practice of medicine. The fields of medicine and law are complex, regulated and often litigated. Changes in the fields of healthcare, medicine and the law can occur on a daily basis and because these changes can be significant, appropriate professional advice, medical, legal or otherwise, should always be sought independently. Princeton Insurance Company makes no representations, warranties or guarantees that the provider's use of this guide will prevent liability claims from being made against the provider.

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ELECTRONIC MEDICAL RECORDS PATIENT SAFETY & RISK MANAGEMENT GUIDE

I. Introduction

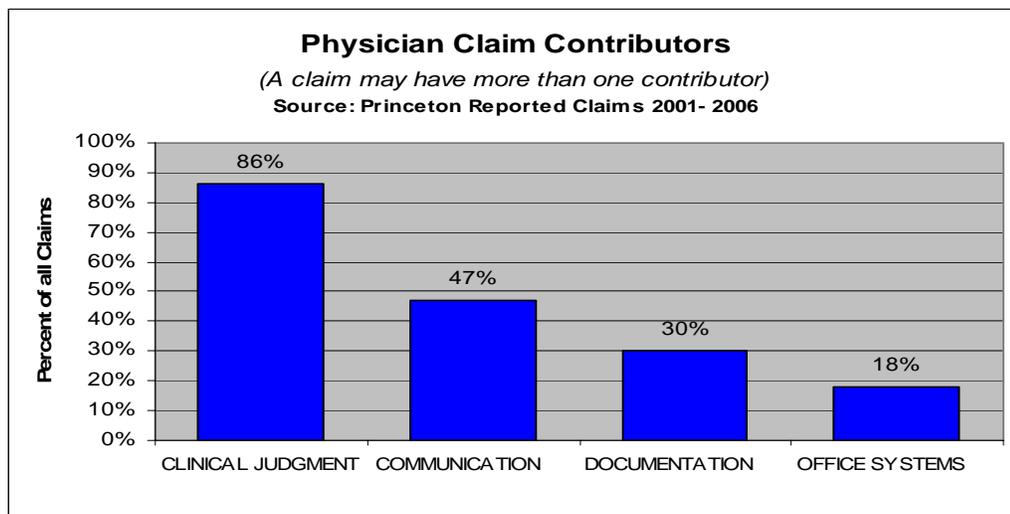
A. Purpose of the Electronic Medical Records Patient Safety & Risk Management Guide

The purpose of this guide is to provide information concerning the appropriate use of certain Electronic Medical Record features to improve the quality and safety of patient care, while decreasing potential liability risk. Electronic Medical Records (EMRs) are defined here as a technology system which permits the electronic recording and transmission of all the information about patients captured during the regular course of business, i.e. clinical encounters, and telephone contacts necessary to constitute a legal record.

Once successfully implemented, EMRs create efficiencies in time and productivity. Gaining efficiencies may provide physicians with more quality time with patients, permit them to see more patients and/or to have less hectic schedules. However, maximizing efficiencies could result in various shortcuts that begin to degrade the patient safety benefits that EMRs offer. So used, EMRs could actually create and propagate both old and new errors. Furthermore, those same efficiencies could create a roadmap for a plaintiff's attorney to attempt to justify a legal action.

This guide will caution against the use (including nonuse, modified or improper use) of EMRs that may actually increase liability risk. It is not all-inclusive; rather it focuses on those areas most likely to involve liability or make litigation more difficult to defend.

There are four broad areas which analyses of multiple years of past claims have identified as most often associated with liability claims where the appropriate use of EMRs could have the greatest beneficial impact: communication between and among caregivers and/or their patients; medical record content and clarity of information (i.e. "documentation"); clinical systems and office practices; and clinical judgment, including those errors involving diagnosis and/or treatment. The clinical judgment category also includes medication errors related to prescribing and monitoring.



There will be numerous examples discussed throughout this guide to demonstrate how EMRs used properly may close care gaps in these four major areas. There will also be significant discussions of how these features may be improperly used to increase liability risk. Each section will include recommendations on how to avoid or mitigate these potential liability risks associated with the use of EMRs while using their key features to improve the quality, safety, and efficiency of healthcare delivery.

Many of the features discussed may affect liability within all or some of these four areas. They are, in fact, interrelated and even interdependent. Consequently, the reader will note some overlap in the mention of these features within these areas. Most pointedly, EMRs may close gaps in all areas, which may ultimately improve clinical judgment and patient outcomes. For example, any kind of communication, documentation and/or office practice or clinical system defect (which the proper use of EMRs may address) could lead to clinical judgment errors and otherwise avoidable adverse patient outcomes that could result in litigation.

B. Scope and Use of the Guide

This reference is intended to serve as a patient safety/risk management guide concerning the proper use of EMRs. Included in the guide are sample screen shots/printouts from a variety of EMR vendors to better illustrate a discussion point. This guide is not intended to endorse any particular EMR system, nor is it to serve as a “how to” implementation manual. Implementation and EMR features are discussed only to the extent that they affect patient safety and/or risk management. This is not intended to be comprehensive, only illustrative. It will not discuss (or compare) the various pros and cons, including costs (both to implement and to maintain) any particular EMR system (or EMRs in general). There are other sources of that type of information to evaluate EMR products, such as EMR buyers’ guides.

This guide should be used to supplement your current use of EMRs or for consideration of the extent to which you will implement certain EMR features. In this context, it should not be regarded as a standalone document for the implementation of EMRs.

C. A Dynamic Document

Liability risk associated with EMRs is evolving. The next few years will see unprecedented growth in the use of EMRs. With that growth will occur not only improvements in the quality, safety and efficiency of healthcare, but potentially greater risks from improper use (and nonuse) of the features of these systems designed to achieve these gains. This reference is intended to be dynamic, and will be updated to reflect evolving developments in the EMR field, especially as they may affect patient safety, medical liability and risk management.

D. The Current Environment for EMR Usage in New Jersey and the U.S.

Despite a more than four-year campaign by the federal government and private sector to increase the use of EMRs, the results of a recently published survey of physicians (conducted between September 2007 and March 2008) revealed that only 17% of physicians in the ambulatory care environment have access to an EMR. More ominously, only 4% (1 in 25) of physicians in this environment have access to a “fully functional EMR” which includes the various safety features such as drug-drug and drug-allergy alerts and full electronic prescribing functionality described in this guide *DesRoches, CM, Campbell, EG, Rao, Sowmya, SR, Donelan, K, Ferris, TG, Jha, A, Kaushal, R, et al., Electronic Health Records in Ambulatory Care—A National Survey of Physicians* (<http://content.nejm.org/cgi/content/full/NEJMs0802005>).

Some other key findings in this study conducted by the Massachusetts General Hospital and Harvard School of Public Health found that 71% of the users of a “fully functional” EMR report that their system was integrated with a hospital system where they admit patients compared with 56% of those users with a basic system who claimed interoperability (i.e. the ability to communicate with other systems outside the base installation or practice setting). Of the 83% of respondents who used neither a basic nor a fully functional system, 16% had purchased a system, but had not installed it yet. Another 26% in this “non-user” group reported plans to purchase such a system within the next two years. Of those with a “fully functional” EMR, 97% of respondents reported using all 16 safety improvement and electronic prescribing functions at least some of the time. Approximately 17% of physicians in groups of 50 or more had access to a fully functional EMR, while in groups of one to three physicians, only 1.8% did--*see the web link reference immediately above.*

To spur adoption of fully functional EMRs while ensuring that those implemented have all those features necessary for complete functionality, interoperability, and security, the federal government designated the Certification Commission for Healthcare Information Technology (CCHIT) to evaluate EMR products and certify them. By focusing on these three areas, the CCHIT is addressing the strongest current and projected future needs of EMR users. The types of safety features discussed in this guide represent many required functionalities in CCHIT-certified EMRs.

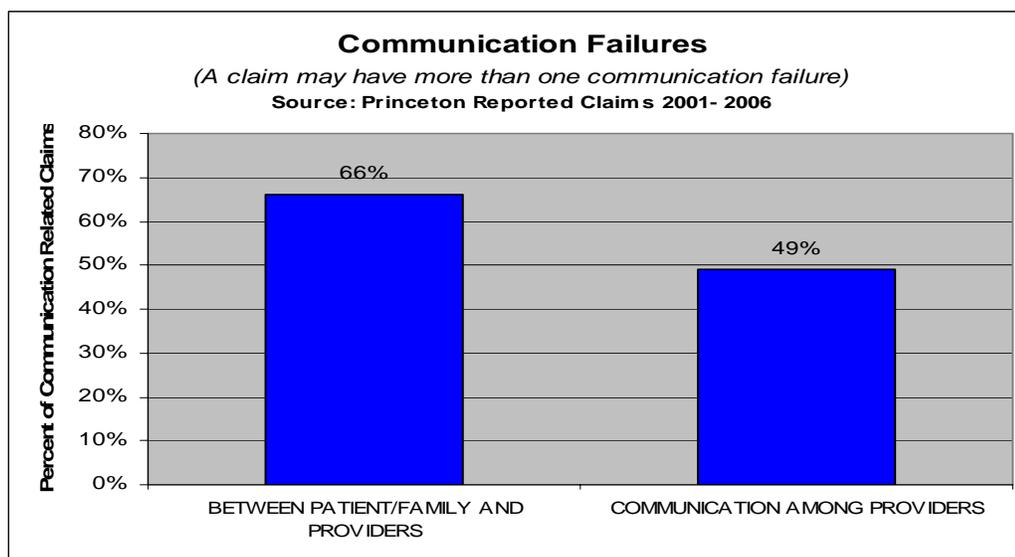
Also, to encourage greater use of fully functional EMRs (especially among the smallest physician groups), the Center for Medicare and Medicaid Services of HHS (CMS), just eight days before the *New England Journal of Medicine* survey’s results were released, announced a new initiative by which individual physicians achieving the highest scores for proper and complete EMR use could gain up to \$58,000 in increased reimbursements over the next five years (more than the per physician cost of most EMR implementations). Unfortunately, at present, none of the 12 announced demonstration sites include New Jersey.

Anticipating the still very limited use of EMRs in New Jersey and intending to provide it with its own boost, earlier this year, New Jersey passed legislation establishing a commission to oversee the widespread deployment of EMRs in the state. Introduced by State Legislator Herbert Conaway, M.D., and recently signed into law by Governor Corzine, the New Jersey Health Information Technology Promotion Act (A-4044) will create an infrastructure to support the creation and implementation of a statewide health information technology system and information exchange to be overseen by a State Health Information Technology Commission. Dr. Conaway recently received an Advocacy Award from the Health Information Management and Systems Society (HIMSS) for his leadership in getting this legislation enacted.

II. Electronic Medical Records—Their Safety and Quality Improvement Features

A. Improving Communication

Perhaps the greatest overall benefit of EMRs is their ability to improve communications among physicians/providers and between physicians/providers and the patients and their families. Almost 50% of all physician claims had communication as a key contributor to the alleged malpractice. The graphic below identifies the breakdown of the communication failures. In both categories, failed communications about the patients' condition is predominant.



The delivery of excellent care in an office-based practice is dependent on the accurate, understandable, complete, and timely communication of information. Certainly, diagnosis accuracy and effective and timely treatment depends on having as much reliable information as possible about a patient available at the point of care or at key diagnostic and therapeutic decision making points. This subpart will discuss how EMRs may accomplish that to improve patient safety while managing risk.

For EMRs to realize their *full* value, they must be able to communicate with the electronic systems of all other caregivers and provider facilities taking care of particular patients. This is known as **interoperability**, which is the ultimate in enhanced communication across providers and facilities and perhaps the Holy Grail for EMR users. It is in recognition of this that CCHIT is making a big push to ensure that EMR companies whose products are certified during 2008 and 2009 are able to demonstrate the interoperability of their products. While interoperability is available with many systems, the reality of system-wide implementation, except for a few spotty areas, is still a ways off.

While lack of interoperability does limit their ultimate value in improving safety and quality of care, EMRs without (or with only limited) interoperability may still significantly improve the content and clarity of communications both within the medical office(s) of a practice and in communications outside of it (or them). EMRs allow for electronic faxing or emailing of information, which can also be performed from remote locations, resulting in a significant benefit to patients accessing care at odd hours, particularly in emergency settings.

1. Among Physicians and Other Caregivers (including Ancillary Providers—Labs, X-ray Facilities, Pharmacies, etc.) Concerning the Patient’s Condition

Analysis of liability claims over the past five years at Princeton Insurance (hereafter Princeton) has revealed communication among physicians and other caregivers concerning a patient’s condition to be one of the most common care gaps associated with litigation. Ensuring that complete, accurate and legible information is communicated from provider to provider is paramount, whether within a medical office or from the office to another healthcare setting. Inadequate content for consultations, miscommunications within the medical office or outside of it, and lack of access to recent care history are examples of communication breakdowns, particularly in handoffs, that have led to significant litigation. The proper use of EMRs can make key attributes of communication between office staff and transmission of patient and patient-related information to external entities involved in the care process more complete, accurate, timely, and effective.

a. Improving intra-office communications

For purposes of this section, “intra-office” communications include the following:

- Communications among physicians, nurses, office managers, clerks, and receptionists within the same office
- Communications among these professionals among multiple offices within the same practice
- Communications among these professionals even when they are not physically in any of the offices (e.g. one or more of those involved in the communication concerning a patient’s condition are in the hospital, at home, on vacation or anywhere else physically outside the office or offices of a practice)

EMRs offer a litany of features that assist in intra-office communications including instant messaging, task lists for completion of time-sensitive requirements, and ready access to medical records for reference in patient phone calls, both during and after normal hours. All of these improve upon the care of the patient and increase efficiencies of the practice, so long as they don’t completely replace good interpersonal communication, which is always in need, and that they don’t become so overwhelming that the intended benefit is lost.

Following is an example of an EMR template focusing on messaging.

Messaging

The screenshot displays a software interface for a medical professional named Dr. Carter, John. The main window is titled "mw_sales_opps - Dr. Carter, John". It features a menu bar with "Desktop", "Tools", "Billing", "New", and "Help". Below the menu is a toolbar with various icons and a "New Message" button. The interface is divided into several sections:

- Calendar:** Shows a date of 7/30/2008 and a list of "Wednesday Visits (8)". Each visit entry includes a time, patient name, and contact information. For example, at 10:00 AM, Fleming, Melissa (4/1/1966, ?) is listed as an Ex1/Nurse with a "Follow Up" note.
- Message Center:** A table showing counts for different message types:

Message Center	U	AL	R	L
Rx Refill	0	0	1	0
Electronic Rx Refill Request				
Phone Message	0	0	2	0
Attachment Approval				
Task	1	0	2	0
- Note Filter:** A dropdown menu set to "My Incomplete Notes".
- 6 Incomplete Note(s):** A list of notes with dates and patient names, such as "6/17/2008 Heart, Jacob (11/28/1945, ?) incomplete". Each note includes a timestamp for when it was last modified by Dr. Carter.

The bottom of the screen shows a Windows taskbar with the "start" button, several open applications including "IMEDICA-SALES", and the system clock showing "4:51 PM".

Source: Misys

Instant messaging is not an EMR exclusive, and is perhaps occurring in offices without EMRs. Attached to an EMR, however, it allows the staff to communicate electronically *within* the EMR system, ensuring ready access to the information that may be required of the message. Connectivity to the patient record eliminates the typical steps involved in transmitting or responding to messages, such as:

- Separate notes that may be lost
- Forgotten messages/tasks
- Disruption of care, if in order to ensure delivery the provider must excuse himself from a current patient (this will not only decrease the risk to the physician's previous patient, but also maintain a better relationship with the current one)

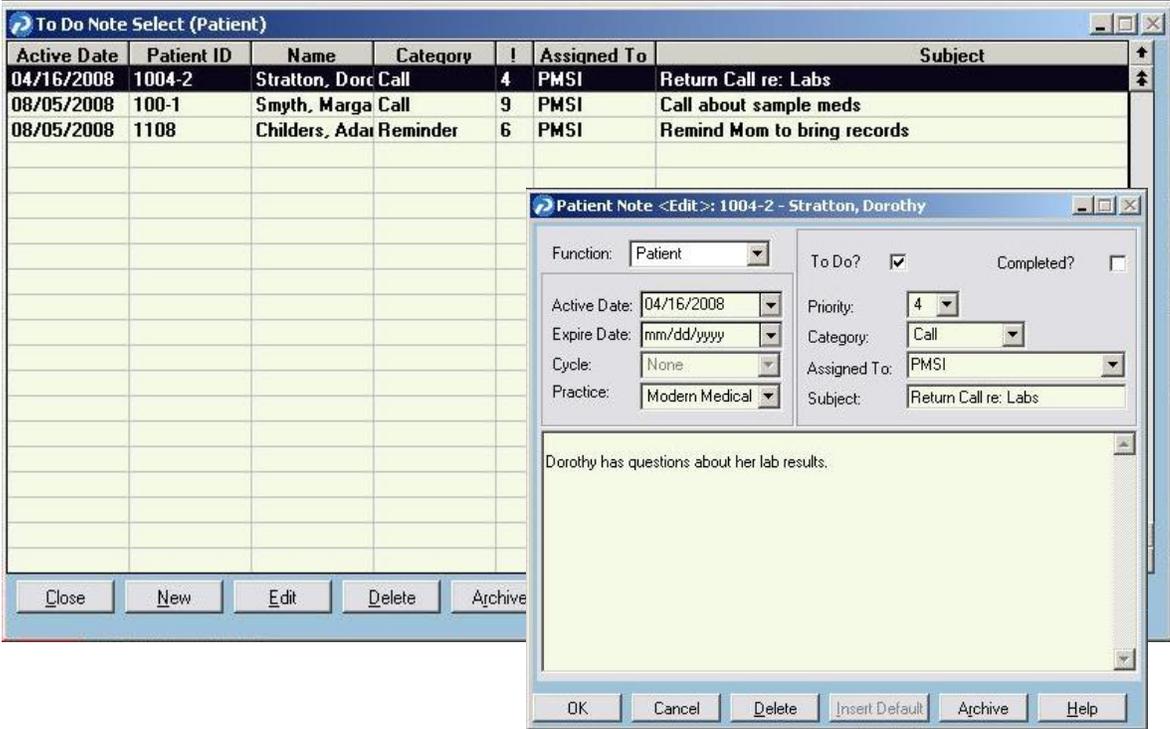
It is even suggested that one of the first features to activate in an office to improve communications among physicians and other caregivers might be intra-office messaging *Lowes, R, Keys to a Successful EHR Rollout; Medical Economics; July 4, 2008 (Duluth, MN)*.

A cautionary note: Any information communicated through an electronic messaging feature, such as instant messaging and emails, will be stored/embedded within the original document, even if deleted (see "electronic footprinting" under the "Improving Medical Record Content and Clarity of Information" section of this guide). As such, just as record alterations might be later detected, so might information exchanged through instant messaging. All staff must be acutely aware of how disparaging remarks about patients, or other extraneous comments about care provided, even though intended to be

transmitted “confidentially” from one staff member to another, may be later retrieved and used against the practice, should litigation ensue.

Task or “to-do” lists within EMRs assist in ensuring that responsibilities important to the complete care of the patient are assigned to an individual and, in order to close the loop on follow-up, require completion in order for them to be removed. Most are configurable by the end user so that they can most effectively prioritize and manage their to-do items. Through task management lists, EMRs may ensure good patient care management both while the patient is in the office and between visits. The emphasis on task lists should be that they focus on those things that are important, such as notifying a patient of an abnormal lab result. To-do lists, like alerts and reminders, can become overwhelming if not managed appropriately. Ensure that what you list as a task remains open and visible until satisfactorily acted upon. Below are two screen shot examples of to-do lists.

To Do Lists



Source: McKesson

<input type="checkbox"/>	Order Date	Coll Date	Result Date	Patient	Labs/Diagnostic Imaging	Reason	Result	AssignedTo
<input type="checkbox"/>	08/08/2008		08/07/2008	Smith, Joe	Urinalysis			Willis, Sam
<input type="checkbox"/>	08/07/2008		08/07/2008	Smith, KM	Urinalysis			Willis, Sam
<input type="checkbox"/>	08/01/2008		08/01/2008	Smith, Amie	Urinalysis		Normal	Willis, Sam
<input type="checkbox"/>	04/03/2008		04/03/2008	Smith, Trevor	Rapid Strep			Willis, Sam
<input type="checkbox"/>	03/28/2008		03/10/2008	Smith, Mary	Pregnancy Test Urine			Willis, Sam
<input type="checkbox"/>	03/27/2008		03/27/2008	Smith, Mary	ekg			Willis, Sam
<input type="checkbox"/>	03/19/2008		03/19/2008	Nelson, Jennifer	ekg			Willis, Sam
<input type="checkbox"/>	01/31/2008		11/21/2007	Doe, Jane	FBS			Willis, Sam
<input type="checkbox"/>	11/20/2007		11/20/2007	Jane, Amanda	FBS			Willis, Sam
<input type="checkbox"/>	08/22/2007		08/22/2007	Smith, Joe	Creatinine		Scanned copy	Willis, Sam
<input type="checkbox"/>	08/06/2007	08/06/2007	08/06/2007	Smith, Jack	PPD		critical high	Willis, Sam
<input type="checkbox"/>	08/02/2006		10/17/2006	Smith, KM	ekg			Willis, Sam
<input type="checkbox"/>	07/07/2006		07/21/2006	Doe, Jane	Urine microalbumin			Willis, Sam
<input type="checkbox"/>	07/07/2006		07/21/2006	Doe, Jane	C-Peptide			Willis, Sam
<input type="checkbox"/>	05/24/2006		10/17/2006	Smith, Joe	ekg		Attached through Midmark	Willis, Sam
<input type="checkbox"/>	01/03/2006		07/21/2011	Doe, Jane	Lipid Test		High	Willis, Sam
<input type="checkbox"/>	10/05/2005		10/13/2005	Smith, Bonnie	Electrolytes (Sodium,Potassium,Chlorides,Bicarb)		Abnormal	Willis, Sam
<input type="checkbox"/>	07/11/2005		07/11/2005	Hayek, Selina	ekg		PENDING	Willis, Sam
<input type="checkbox"/>	05/03/2005		11/19/2007	Jane, Amanda	PAP Smear		Abnormal	Willis, Sam

Source: eClinicalWorks

Telephone communications are a significant component of most practices and can lead to claims when decisions are made or answers are given based on erroneous information. Additionally, lack of documentation for phone calls not only weakens the defense of a claim, but can also lead to claims by limiting information available to other subsequent providers. EMRs allow for ready access to patient information that may be vital in a telephone response and allow for same-time documentation. From a safety and risk management standpoint, this EMR function may be especially valuable after hours and where a contemporaneous running chronology of multiple calls to different staff is essential to care.

For **covering physicians** within the same practice, EMRs may also significantly improve the ability to discuss and evaluate patients even when offsite. Each caregiver has instant access to complete, timely and accurate information about a particular patient. This may even include graphical displays of a patient's clinical findings (e.g. blood sugar, kidney function, blood pressure) over time that assists familiarity with patients. Below is a screen shot of a one-page patient summary which could be useful for a covering physician.

Patient Summary

NextGen

PATIENT: Robert Hartley
DATE OF BIRTH: 01/01/1978
DATE: 10/19/2007 3:50 PM

Allergies:

Allergen/Ingredient	Brand	Reaction:
Metronidazole	Flagyl	Rash

Vital Signs

BP	Temp F	Pulse	Resp Rate	Ht In	Wt Lb	Pain Score
129/73	100.1	68	19	69.0	169.00	2/10

Assessment/ Plan

Acute Bronchitis (466.0), Acute.

Medications (added, continued or stopped this visit):

Drug Name	Dose	Qty	Description
Proventil	90mcg	1	Inhale two times by mouth every four hours as needed
Zithromax Tri-pak	500mg	1	Take one tablet by mouth daily

Office Labs

Status	Ordered	Order	Reason	Interpretation	Value
completed	10/19/2007	Rapid Strep		see detail	positive

□

Source: NextGen

Certain **administrative features** offered by EMRs assist in reducing the likelihood of communication errors. These include appointment scheduling, missed appointment alerts, ordering of labs and consults, and perhaps email communication with patients, all of which should reduce handoff communication errors while enhancing productivity of the office. EMRs allow the provider to complete certain tasks at the point of care (e.g., producing orders for tests and consults and, when utilized with Practice Management Software (PMS), scheduling the next appointment) prior to the conclusion of the current visit. Scheduling appointments in the EMR at the point of care is an excellent way to track patient compliance. Besides assuring that the appointment is made, an alert is then prompted for inclusion in the task list should the patient not meet that appointment. Both of these examples allow for better management of the patient without risking failed communication and patient safety.

Finally, EMRs have the added benefit of getting everybody in the office (physicians, nurse managers, physician assistants, office clerks and practice managers) “singing from the same sheet of music” when it comes to patient care management. Functions that ensure good documentation, such as checklists, and those that enhance clarity through legibility and consistent presentation can go a long way to preventing miscommunication. For these benefits to be realized, however, it is important that ALL providers and staff in an office use the EMR. Having some providers continue to use paper records creates a hodgepodge of paper and electronic records that increase the chance for error, particularly when coverage situations arise (see also EMR Implementation). It also requires that you maintain two systems for office processes, for example tracking tests

and consults (see Office Practices and Systems), reducing or eliminating any efficiency gains.

POTENTIAL PITFALLS
<ul style="list-style-type: none">• Allowing tasks to be “closed” without requiring action. Having a list that tells you what to do and when is a wonderful tool for ensuring you do not lose sight of a particular task. Should you not do what is required, however, the electronic record of the reminder will significantly weaken a claim defense. It is critically important never to close a task without taking some kind of action on it, or explaining why nothing was done.
<ul style="list-style-type: none">• Relying too much on electronic communications at the expense of face-to-face interactions among physicians and office staff. Doing this can actually have the unintended effect of degrading intra-office communication which can have negative consequences. It is especially important in the early stages of implementation to continue these ongoing face-to-face interactions.
<ul style="list-style-type: none">• Not requiring ALL office providers to use the EMR. If all providers and staff do not use the EMR, you can enhance the chance for patient care errors, particularly in coverage situations, and reduce or eliminate any efficiencies.

b. Improving communications among providers outside of your practice

To the extent that EMRs are **interoperable**, with proper security and privacy protections, they may be shared directly with those outside the practice (e.g. with pharmacies, laboratories, radiological facilities, Emergency Departments, hospitals, and other physicians). Of course all normal written patient authorizations are still required. **Full interoperability** involves the ability to share all the electronically aggregated information on a patient in real time with others (including those at the point of care). Full interoperability permits all information on each patient to be organized and displayed in the same way to all viewers of it simultaneously in real time.

As mentioned previously, full interoperability affords the best in communications among providers. Nevertheless, EMRs without interoperability can still significantly improve the content and clarity of communications among providers not associated with your office.

Partial interoperability only permits this degree of sharing with those on compatible electronic systems. “Interoperability” in this sense does not extend to all or even most of the care settings in which your patients may receive care. Nevertheless, EMRs may still provide physicians and other caregivers with the advantage of being able to transmit complete, timely, and accurate patient information (through electronic fax and other means) both after hours and remotely to hospitals, emergency departments, laboratories, x-ray facilities, and other physicians. These EMRs may also produce complete, timely printouts for patients, including summarized information, to bring to laboratories, x-ray facilities, or consulting physicians. This capability of EMRs could be characterized as **substituted interoperability**.

With **partially or substituted interoperable EMRs** (which are by far the most common today), there are various things that need to be kept in mind to ensure patient safety and good risk management. Most notably are *ensuring that the information you transmit (share) is interpretable and that it contains the necessary information to support the*

intent of the referral. This is not different from what should be performed today to support patient safety and risk management. With EMRs, however, printed information can appear very different from that into which you are entering data. Furthermore, the volume of readily transferrable information available to you can be voluminous and thus impractical to the receiving party. One of the biggest complaints from external consultants receiving electronic patient information is that the information transmitted does not provide an interpretable rationale for the referral or consultation itself. These consultants often receive the output from a series of checked boxes and templates that provide too much information about the patient and too little concerning exactly why they were consulted.

In order to ensure that the EMR is optimally used for transmission of information among providers, consider the following:

- When using EMRs for the first time (or if you have not already done so for an EMR that has been functioning), take the time to review all printable documents from the EMR. Doing so will ensure that you are aware of how they will appear to another provider or to a jury in a malpractice case. Familiarization will assist you in knowing how best to use or explain content.
- For electronic transmissions to pathology laboratories and x-ray facilities or consultants, use the available referral checklist that leading EMRs have to include all pertinent information about the patient, including diagnosis (or diagnostic impressions), current conditions, current treatment, and response (or no response) to therapy. Many of these templates auto-populate ensuring the completion of the relevant fields. If they do not contain them, they can usually be created. Equally important, using standard forms will help ensure you do not do the converse – provide too much information.
- When sending electronic consultation requests, it is critically important that the information conveyed is clear and focused on the particular area that is the subject of the consultation request. The transmission of patient summaries with graphical displays of clinical indicators (such as blood pressure, cholesterol or creatinine levels, or many other parameters available in a longitudinal Continuing Care Record or CCR) may prove to be very useful to consulting physicians in being able to leverage their specialized expertise and experience in diagnosing and/or treating patients.

The information in the section above concerns primarily the patient safety and risk management implications of transmitting electronic information on patients. A later section of this guide titled “Improving the Content and Clarity of Information” will focus more on the patient safety and risk management aspects of using EMRs to receive and otherwise import electronic (and non-electronic) information.

POTENTIAL PITFALLS

- ***The creation of useless electronically generated consultation requests.*** This can be because of uninterpretable checklists or other material or because of too much information that confuses the consultant. The keys to avoiding this trap is awareness of that which is produced, committing to using free text where clarity is required and more focused box-checking to produce useful consultation requests.

POTENTIAL PITFALLS

- **Failure to use the interoperability that is available.** There may be risks to not using the interoperability that is available to communicate vital information to other physicians and providers in the care delivery process at critical times. Physicians (and others) who have the capabilities to transmit or receive information electronically or through interoperable systems but who do not do so, could find themselves in a difficult defensive posture should they become involved in litigation in which timely transmission of patient information could have made a difference in preventing an adverse outcome. Physicians should use whatever capabilities they have at their disposal in their EMR systems to transmit all relevant electronic (as well as non-electronic) information as part of all of their patient's medical records.

2. Between Physicians and Their Patients and Families Concerning the Patient's Condition

Failed communications between patient/family and provider are often cited as the reason for unsuccessful diagnosis, treatment, or patient compliance. While not a substitute for personal interaction, EMRs can clarify a message and facilitate a more structured visit. This section details how EMRs may improve communications between physicians and their patients and families (or surrogates). It will focus primarily in two areas, namely how EMRs may better inform physicians (and other caregivers) themselves in communicating with patients and their families, and, secondly, how the EMR (including even the paper output of an EMR) may help educate patients and their families more directly.

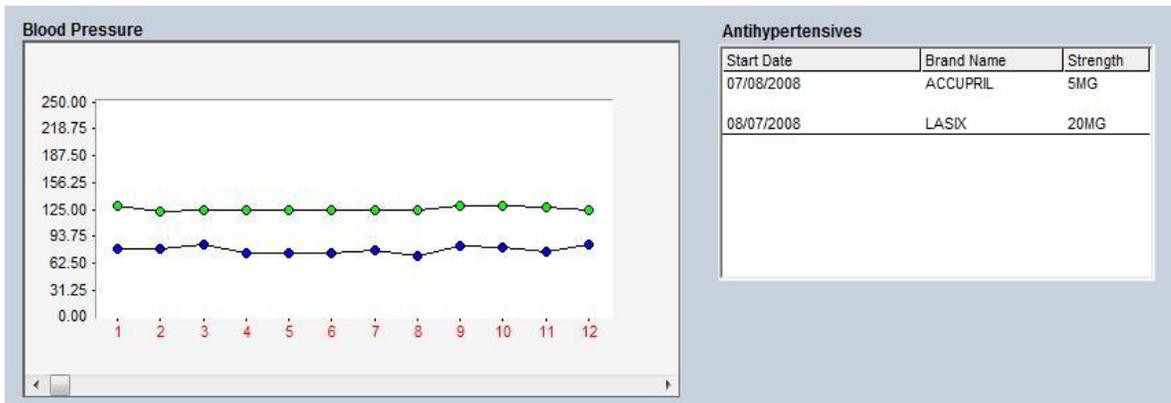
a. Informing the physician's or other caregiver's communications with patients and their families

The delivery of excellent care in an office-based practice is dependent on the accurate, understandable, complete and timely communication of information. Supporting this premise, EMRs may better inform a physician's or other caregiver's decision-making concerning what to communicate to patients and their families in the following ways:

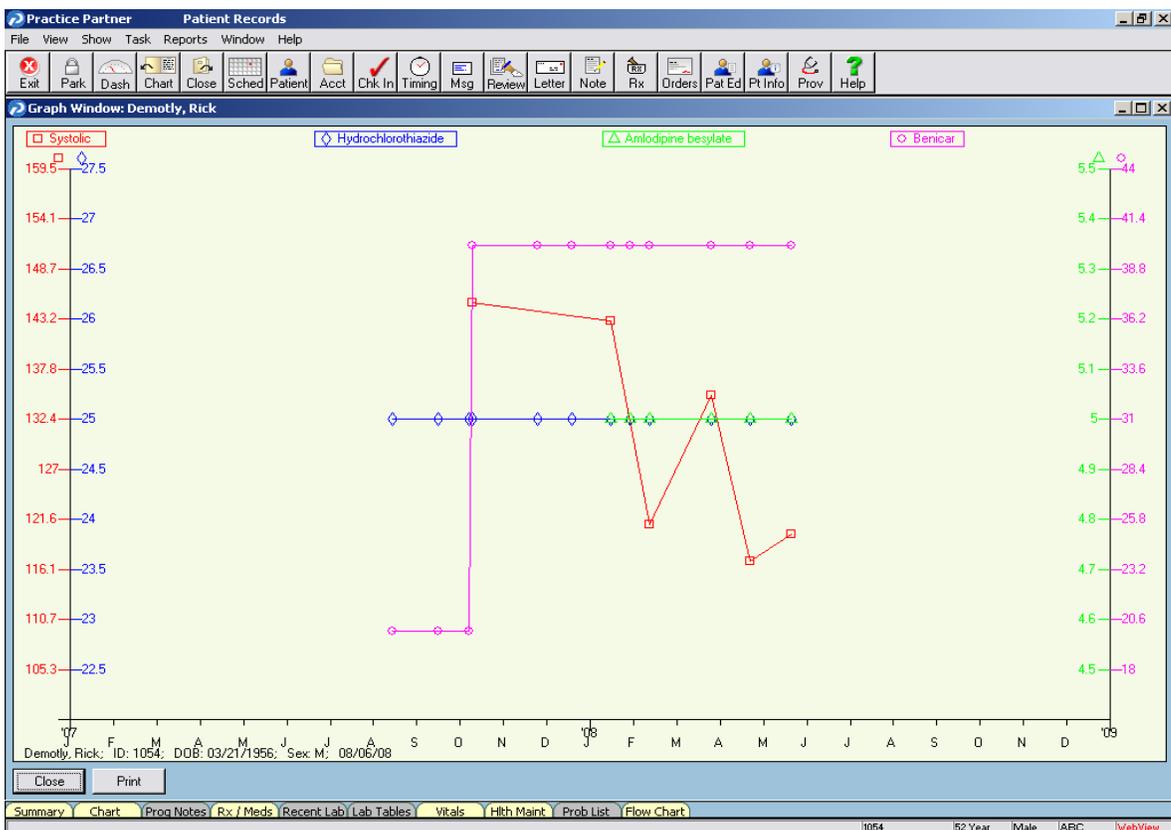
- By **aggregating** all information about each patient in one place
- By **prompting** the physician or other caregiver to ask all pertinent questions of patients and their families during histories and physicals and other information-collection processes
- By **illustrating** through graphical displays the progression of a patient's clinical course and response (or no response) to treatment

Used appropriately, the EMR can organize information about the patient in a readily readable format informing the physician of pertinent information such as medications, recent visits, lab values, and potential non-adherence with recommended tests or consults. Accessing the information in graphical format (see below) can demonstrate more clearly the response to treatment. Graphics, including labs, vital signs, pain scales, etc. can be created for any numeric values over time and placed as part of templates.

Graphical Displays



Source: NextGen



Source: McKesson

Non-compliance with recommended tests or consults or even missed appointments, which can be an indicator of lack of clear communication, is tracked far more easily with EMRs (see further discussion in the “Improving Office Practices and Clinical Systems” section), generating an alert when results are not received. These alerts are generated whether the patient has a current appointment or not. If not, then a letter or telephone call can be used to communicate the alert. Examples of the promptings to communicate with their patients that EMRs may provide to physicians and their staff are discussed in more detail below in the “Improving Office Practices and Clinical Systems” section. Similarly, electronic prescribing programs may help physicians track whether their patients have filled certain prescriptions (which could, in some cases, be life- or health-saving). Furthermore, templates guide the provider through a visit, providing structure and

appropriate prompts to facilitate a more organized and thorough use of time, that should afford better, and more satisfying, dialogue with the patient.

All of this should aid a physician in explaining his/her thinking to the patient and patient's family. Also, EMRs used in this way may justify the course of action the physician took should there be subsequent litigation.

b. Improving communications with patients and their families more directly

Large care gaps could result in avoidable adverse outcomes and litigation when patients or their families do not act upon the advice given by their physicians. They may not act either because the information is not passed on by their physicians, it is illegible, or otherwise unintelligible. EMRs offer the following features to improve communications with patients and their families:

- Printed Visit Summaries (sample below). For patients, EMRs may compile and print out summaries of each clinical encounter. These summaries may include the chief complaint, historical and physical findings, review of systems, diagnostic impressions, therapeutic suggestions, and follow-up recommendations, including under what circumstances to seek medical attention even before the next scheduled appointment. Doing this also reinforces certain messages to patients about their condition, what's been recommended, what they should do and not do, when to return, or what to do if something serious occurs between appointments. Beyond enhancing summary communication to the patient/family, a key benefit is the opportunity for patient review of information for accuracy and completeness, which may highlight important facts including missing family history, symptoms, drugs, or other inaccuracies.

Patient Visit Summary

Grove Medical Associates, PC

Summary of Today's Visit

Smith, Joe

08/21/2008 visit with Sam Willis, M.D.

Treatment

- Start Pegasys : 180 MCG/ML Subcutaneous 1 ml Once a Week
- Taking Coreg CR : 80 MG Orally 1 capsule with food Once a day
- Taking Aspirin : 325 MG Orally as directed
- Taking Plavix : 75 MG Orally 1 tablet Once a day

Notes: STOP EATING FRUITIS - LATE EVENING, COMPLETELY STOP CITRUS BASED FOOD ITEMS.

We have ordered the following tests for you

Labs:

- CBC with Diff on 08/21/2008
- Lipid Profile on 07/29/2008
- CMP on 10/01/2008
- HgA1c on 01/01/2009

Imaging Studies and Other Tests:

- X ray : Abdomen-KUB with upright film
- Ultrasound : Abdomen on 08/21/2008

Your Next Appointment(s)

- 08/27/2008 at 01:30 PM

Recommended Wellness and Prevention

You are due for:

- Colonoscopy on 11/01/2012
- Lipid Test on 11/20/2008
- HgA1c on 10/01/2008
- TSH (Thyroid Stimulating Hormone) done every 1 Year(s)
- Foot Exam done every 1 Year(s)
- Annual Eye exam done every 1 Year(s)

Please consider discussing these items with your doctor

You are Diagnosed with

- 070.51 Hepatitis C
- 530.19 GERD

Your weight and blood pressure history:

Date	Weight	Blood Pressure
05/23/2007	190.0	126.0/76.0
03/19/2007	245.0	142.0/90.0
03/18/2007	237.0	150.0/84.0
03/04/2007	195.0	128.0/78.0
02/02/2007	202.0	128.0/78.0
01/24/2007	222.0	132.0/84.0

Your Goal Weight: 167
Your Goal BP: 130/80

Your HbA1c history:

Date	Result
05/23/2007	7.0
03/19/2007	10.4
03/18/2007	11.0
03/04/2007	7.5
02/02/2007	8.9
01/24/2007	9.5

Recommendations:
Test/Treatment Type: GlycoHgb(HbA1c)
Standard for your care: Check every 6 months; Goal < 7
Additional Information: Measures average blood glucose over the last 3 months

Your LDL history:

Date	Result
05/23/2007	73.0
03/19/2007	129.0
03/18/2007	140.0
03/04/2007	89.0
02/02/2007	105.0
01/24/2007	120.0

Current	Goal
Cholesterol	200.0 200
Triglycende	158.0 150
HDL	43.0 >40

LDL checks for "bad" cholesterol that can increase risk of heart attacks
*NCEP Goal - National Cholesterol Education Program
**Personalized LDL Goal - the NCEP recommends a lower LDL goal for patients with certain risk factors

Grove Medical Associates
Note generated by eClinicalWorks
(www.eClinicalWorks.com)

Source: eClinicalWorks

- Printed discharge/follow-up instructions and educational materials. Legible instructions, including easily producible educational materials about the patient's condition, enhance patient compliance.

Educational Materials

The screenshot shows a web browser window with the title 'PMSI - Browser - Adult Health Advisor 2006.4: Otitis Externa (Swimmer's Ear)'. The address bar shows the file path: file:///C:/ppart/PatientEducation/aha/aha_otiexter_crs.htm. The main content area features the 'PRACTICE PARTNER' logo and the tagline 'A better way to practice.™'. Below the logo is a navigation bar with 'Index' and 'Illustration' links. The main heading is 'Otitis Externa (Swimmer's Ear)'. To the right of the heading is an anatomical diagram of the ear. The text on the page is as follows:

What is otitis externa?

Otitis externa is an infection of the ear canal. Otitis externa is also called swimmer's ear.

How does it occur?

Bacteria and sometimes fungi may cause the infection. It can result from an injury, as might occur if you use a Q-tip to clean your ear canal. It can also be caused by dirty water in your ears (for example, from a lake or ocean). Frequent showering or swimming can increase the risk of getting an infection. Otitis externa often occurs in the summer from swimming in polluted water. The chemicals in hair spray or hair dye may irritate the ear canal as well and increase the risk of infection.

Some people get otitis externa repeatedly, especially if they clean their ears too vigorously. People who have skin allergies also seem particularly prone to otitis externa.

What are the symptoms?

Source: McKesson

- Transfers to personal health records (PHRs). Some EMR systems may be able to automatically download all of the above information directly into a patient's own electronic PHR (either directly or indirectly by giving the patient the information on a jump drive). Conversely, some electronic PHRs, when patients or their families add to them, may be automatically uploaded to that patient's EMR.
- Language conversions. Finally, many of the leading EMRs now may permit for automatic translation of follow-up instructions in the patient's native tongue. This has obvious benefits for good physician-to-patient communication in multi-lingual environments.

A note on informed consent. Informed consent represents a critical area for accurate communication between physicians and their patients, and/or their patients' families, concerning the patient's condition and what, if anything, to do about it. EMRs do not currently offer, in our opinion, any significant advantages over paper records, other than allowing for any forms to be scanned and made part of the electronic record. Forms completed entirely within the EMR and offered to the patient for signature can result in an appearance that could suggest an impersonal, and therefore, uninformed consent. Regardless of the type of form that is ultimately used, ensure that there is a contemporaneous note in the record that details the informed consent discussion. Providing a copy of this part of the record to the patient at that time will assist in the demonstration that adequate consent was obtained.

The one exception to the limited value of informed consent in EMRs is that in some of the latest versions of leading EMRs, there are becoming available “tablet” technologies that permit physicians (as well as their patients) to write electronically directly onto screens. This feature permits physicians to construct diagrams and pictures of recommended interventions, as well as for their patients to add their own details to these, and ultimately sign the consent forms which become part of the EMR itself.

POTENTIAL PITFALLS
<ul style="list-style-type: none"> • <i>Reducing patient communications for fear of disclosure.</i> Assure patients of the security, confidentiality, and privacy of their patient-specific clinical information and communications. Moving to an electronic records environment may create anxieties in patients concerning the security, confidentiality, and privacy of their personal health information. This anxiety could translate into patients and their families not being as open in their communications with physicians and other caregivers as in the past non-electronic environment. <i>To overcome this, physicians must explain to all their patients concerning the security features which their EMRs possess to ensure the continuing privacy and confidentiality of their EMRs (especially if those EMRs are to be transmitted outside of the office or practice).</i>
<ul style="list-style-type: none"> • <i>Alienating patients.</i> All of the advantages afforded by EMRs can be somewhat undone if you alienate the patient as a result. This can occur when taking too much time typing and not enough time talking with patients. This is particularly troublesome when facing away from the patient because of the design of the room. Should the physician sense that this is (or could become) a problem (which could interfere with otherwise good patient relations, trust and communication), physicians could consider having a nurse manager or other staff member in the room to record the information while the physician talks with the patient, even if just for the initial stages of implementation. This is discussed in the “Implementation Considerations” section of this guide below. <i>Physicians should not allow the computer to interfere with speaking directly to their patients.</i>

B. Improving Medical Record Content and Clarity of Information (through Better Documentation Practices)

Perhaps one of the most sought after benefits of EMRs is the ability to create a paperless, efficient environment and collect all information in an organized manner that is readily recalled when needed. Besides the obvious efficiency benefits, this can play an enormous role in reducing risk and furthering patient safety by efficiently aggregating pertinent, accurate and timely patient and patient-related information to facilitate optimal clinical decision making at the point of care. The simple elimination of illegible handwriting plays a significant role in reducing communication errors and embarrassing courtroom appearances. Standardized collection and evaluation of complete information on patients promotes content and clarity, the availability of which assists the physician in better decision-making, enhancing patient safety, and helping substantiate a physician’s diagnostic and therapeutic decision-making process. Depending upon the level of interoperability, the patient safety benefits and efficiencies can be exponential.

*The efficiencies gained can be invaluable to a physician's practice, but this is one area in which the efficiencies gained must be thoughtfully weighed against the potential to **increase** liability.* Used properly, EMRs help physicians to capture all relevant patient and patient-related information quickly and accurately. Used improperly, they become an easily discoverable and useable tool to help the plaintiff make his or her case.

1. Improving the Mechanics of Medical Recordkeeping

Paper-based records have many disadvantages when it comes to some of the most fundamental aspects of medical recordkeeping. Poor medical recordkeeping can lead to errors in care and can be deadly to the defense of a case, even when the care delivered has not been negligent. Inaccuracies or omissions of information, illegibility, or incorrect methods to make a correction may cast doubts about the quality of care provided, as well as the credibility of the provider. Besides improving legibility, EMRs have great potential for improving other mechanics of documentation through features that should be available regardless of the EMR you choose. These include:

- The elimination of confusing abbreviations and acronyms
- Differentiation of similarly spelled (or pronounced) medications
- Eliminating preceding and trailing "0's" for orders or prescriptions
- Auto dating and timing of entries
- Ensuring that any alterations to a completed record are done appropriately

The last two features assist in removing any questions of impropriety after a malpractice suit has been filed. In fact, the final point is so important that it warrants an extended discussion.

Medical record alterations represent one of the most important areas in any type of medical recordkeeping (electronic or non-electronic) in which changes, whether they be additions, addendums or deletions to entries, need to be done properly to avoid any potential legal repercussions. Most EMRs permit changes prior to locking (usually triggered by a physician signing off). These alterations may or may not be indicated and authenticated concerning who changed the records, and how, prior to their being locked, depending on the particular EMR system used. EMR systems often permit physicians to keep records open (i.e. unlocked), for a period of time, so that lab, X-rays and even consultations may be incorporated.

Record Alteration

Practice Partner Patient Records

File Edit Insert View Show Task Reports Window Help

Exit Park Dash Chart Close Patient Letter Msg Sched Note Pt Info Prov Rx Orders Pat Ed Help

Changes to Note: from 08/06/2008 to 08/06/2008 Smyth, Margaret

Patient's Name

ID: Text Age: Text DOB: Text

Date: 08/06/08 : 05:15pm
Title: OTITIS EXTERNA:

Subjective:

Today's Vitals: Bp: 132/92, Left Arm, Pulse: 74. Temperature: 98.6 F, Height: 5'4", Weight: 135 lbs. Respirations: 14.

Action Item: Please schedule follow-up visit in 1 week to recheck blood pressure.

BMI: 23.19 kg/m2.

Allergies: SULFA, PENICILLIN G POTASSIUM (skin rash). Allergy history last updated on 08/01/08.

This 64 yr old female presents with a history of ear pain.

Problem 1: Ear pain.

Symptoms: Involved ear(s): both right. Duration: 3-5 days. Pruritus: no. Discharge: no. Fever: no. Hearing loss: no.

History of: Water immersion yes. Cleaning with cotton-tipped applicator no.

General: Well appearing, well nourished in no distress. Oriented x 3, normal mood and affect.

Left ear:
Canal: non-inflamed

Right ear:
Canal: inflamed

Tympanic membrane color: gray
Tympanic membrane landmarks: visible
Tympanic membrane mobility: Present

Nose: no external lesions, mucosa non-inflamed, septum and turbinates normal

Mouth: Mucous membranes moist, no mucosal lesions.

Pharynx: mucosa non-inflamed, no tonsillar hypertrophy or exudate

Neck: supple, without lesions, bruits, or adenopathy, thyroid non-enlarged and non-tender

Lungs: clear to auscultation and percussion

Assessment:

Other Problem: INFECTIVE OTITIS EXTERNA : 380.1
Involved ear(s): right

Plan:

Patient education: Avoid allowing moisture in the ear during treatment, use medication only 5 to 7 days, avoid cleaning with cotton-tipped applicators. Follow up if improvement does not occur in 48-72 hours.

Procedure: Office Visit Level 3 : 99213
Evaluation and Management code calculated based on the 1995 CMS Guidelines.

Rx: ACETIC AC-ANTIPTY-BENZO-PO* 30mL 3-5gtts four times daily for 7 days, 84gtts, Ref. 0

SIGNED BY Cobb B Able, Jr., M.D. (ABC) 08/06/2008 05:25PM
REVISED BY Cobb B Able, Jr., M.D. (ABC) 08/06/2008 05:28PM

Summary Chart Prog Notes Rx / Meds Recent Lab Lab Tables Vitals Hlth Maint Prob List Flow Chart

100-1 | 64 Year | Female | ABC | WebView

Source: McKesson

With all of the leading systems, however, once the EMR is locked, then any alteration must be in the form of an addendum. Some leading ambulatory systems would label any alteration to the medical record as an “addendum,” even if made before the physician user formally signs off on the record and locks it.

Record Addenda

NextGen EMR: Ben Barker - [(01/18/2007 10:17 PM) 08/07/2008 11:21 AM : Document "HPI"]

File Edit View Tools Utilities Insert Format Window Help

Main Office Barclay, Joseph MD

Chief Complaints (01/18/2007 10:17 PM)
08/07/2008 11:21 AM

Ben Barker(Date of Birth: 09/01/1956)

1. hernia Duration: 2 Week(s) Location was LLQ. There was radiation to loin to groin. The patient describes it as dull. ~~Identified risk factors include heavy lifting.~~ There are zero identified risk factors. Symptom is aggravated by lifting weight.

Joseph Barclay MD

Source: NextGen

Misys EMR - [Patient Summary]

Patient ID: 00814578 MRC ID: OFFICE

File Close 3/3 100% 2/10 Print Diagrams

3/21/2007 Test Name: HGBA1C
increased from 6.0 in 2004

ASSESSMENT/PLAN
250.02-DMII WO CMPUNCNTRLD

MEDICATIONS:
ACTOS ORAL TABLET 15 MG, 1 QD, 30 Dispensed, 2 Fills, 30 Duration/Days
Supply, 1 samples given, - lot numbers = 4527, status: NEW PRESCRIPTION,
05/13/2007.

LAB ORDERS:
Order number: 323 Test Ordered: CBC
Order number: 323 Test Ordered: CREATININE CLEARANCE
Order number: 323 Test Ordered: GLUCOSE
Order number: 323 Test Ordered: HGBA1C
Order number: 323 Test Ordered: LIPID PANEL
Order number: 323 Test Ordered: MICROALBUMIN

V70.0-ROUTINE MEDICAL EXAM
LAB ORDERS:
Order number: 323 Test Ordered: MAMMOGRAM

PREVENTIVE COUNSELING: The patient was counseled. DIAGRAM: [PREVENTIVE COUNSELING]

Electronically Signed by: Arnold Eiser, MD on Monday, May 14, 2007

*** Addendum - 05/14/2007 02:50 pm

insert comments

Electronically Signed by: Arnold Eiser, MD on Monday, May 14, 2007

INS Page: 3 Line: 6 Col: 1

start Misys EMR - [Princeton Scr... Inbox - Micro... Calendar - Mi... Desktop 10:16 PM

Source: Misys

Systems may allow the administrator (you) to establish the rules as to the maximum timeframe in which entries must be signed off, thereby rendering and labeling any subsequent change to the record entry as an addendum. These systems typically have the ability to track and record changes as well. It is critically important that you are aware of all tracking features, that you establish all rules during the implementation phase and that you adhere to

those consistently. A system that clearly shows what was changed, when it was changed and by whom will virtually eliminate any impression of impropriety in modified records.

2. Improving the Sufficiency of Medical Recordkeeping

“Sufficiency” pertains to whether there has been enough information captured in the patient’s medical record to permit optimal diagnostic and therapeutic decision-making. EMRs may improve the sufficiency of medical record information (and therefore its content and clarity) through the use of checklists and templates, compilation of both electronic and non-electronic sources of patient information, and straddling both mechanics and sufficiency, “electronic foot printing,” which records entries by whom and when (“data about the data”).

a. Checklists/templates and auto-population of data

It is in this area where it is critical that the balance between efficiency and safety be carefully weighed. While these features assist in the gathering of information or in better documenting the visit, they invite opportunity for error.

Checklist

The screenshot shows a software interface for an HPI (History of Present Illness) form for the abdomen. The form is titled "HPI: Abdomen" and is part of a "NextGen EMR" system. The patient is identified as "Murry, Robert L MD" at "Delaware Valley Family Health C". The form includes a "CONCERN" field with the value "abdominal discomfort". Below this, there are fields for "Onset" (6 Hour(s) ago), "Duration", "Severity" (severe), and "Status" (improved). There are also fields for "Frequency" (constant) and "Status" (improved, worse, resolved). The form is divided into several sections: "Location" (diffuse, peri-umbilical, epigastric, rectum, hypogastric, RUQ, LUQ, midline, RLQ, LLQ), "Radiation" (back, chest, groin, left flank, neck, pelvis, perineum, rectum, right flank, shoulder), "Quality" (aching, bloating, burning, colicky, dull, gnawing, sharp, stabbing, tender, throbbing), and "Context" (after BM, after meals, empty stomach, lying down, menstrual, mid-cycle, no pattern noted, on urination, wakes from sleep, with BM, premenstrual). There are also sections for "Aggravated by" (alcohol, anxiety, bending over, bowel movement, brassica vegetables, constipation, exercise, fatty foods, food, heavy meals, intercourse, lying down, medication(s), milk/dairy products, movement, nothing, NSAIDs, physical exertion, pressure to abdomen, prolonged sitting, prolonged standing, respiration, spicy foods) and "Relieved by" (analgesics, antacids, bowel movement, change in position, eructation, flatatus, food, H2 blockers, lying down, Nexium, Prevacid, Prilosec OTC, Protonix, physical exertion, pressure to abdomen, proton pump inhibitors, rest, vomiting). The form includes "Associated Symptoms" (vomiting, fever, and nausea) and "Pertinent Negatives" (blood in stool, blood in urine, diarrhea, and rash). There is a "Comments" section with checkboxes for "recent travel out of country", "reptile pets", and "well water". The form has "OK" and "Cancel" buttons at the bottom. A sidebar on the left contains navigation options like "HOME", "Demographics", "Record Vital Signs", "Nurse Documentation", "Chart Summary", "View Results", "Allergies", "Immunizations", "Past Medical History", "Family History", "Social History", "Health Maintenance", "HPI / Problem List", "Review of Systems", "Physical Exam", "Procedures", "Assessment", "Disease Management", "Plan / Lab / OS / Diag", "Document Library", "E&M Coding", "Coumadin", "Adult Office Visit", and "Nutrition Assessment".

Source: NextGen

Grove Medical Associates, PC

T, TEMPLATES

31 Y old , DOB: 01/01/1970
114 turnpike road, Suite 204, Westborough, MA-01581
Home: 508-836-2700

01/01/2001

Progress Notes: Sam Willis, M.D.

Current Medications

None

Review of Systems

General:

denies weight gain. denies loss of appetite.
denies fever. denies weakness. denies fatigue.
denies heartburn. denies blood in stool.

Gastroenterology:

denies difficulty swallowing. denies abdominal pain. denies vomiting. denies constipation.
denies diarrhea. denies change in bowel habits.
denies bloating/belching. denies heartburn.
denies bleeding/black stools. denies poor appetite.
denies regurgitation.

Neurological:

denies headache. denies tingling /numbness.
denies seizures. denies weakness. denies tremor.
denies dizziness. denies stroke.

Cardiology:

denies chest pain. denies palpitations. denies leg swelling. denies shortness of breath.
denies orthopnea. denies chest pressure.
denies ankle swelling. denies ringing in the ears.
prior workup yes. denies irregular heart rate.
denies leg swelling.

Musculoskeletal:

denies joint swelling. denies joint pain. denies leg cramps. denies joint stiffness. denies joints popping.
denies restrictive range of motions. denies back pain.
denies muscle spasms. denies neck pain.
denies numbness. denies neck pain.

Ophthalmology:

no diminished vision. no eye irritation.
no drainage from eyes. no blurring of vision.
no seasonal eye sx. no dander related eye sx. no dry eyes.

Dermatology:

denies rash. denies change in color of moles.
denies lumps. denies dry or sensitive skin.
denies hives. denies Sun burn. denies rosacea.
denies itching. denies lupus. denies Hx of skin cancer. denies jaundice.

Endocrine:

denies tiredness. denies excessive sweating.
denies excessive thirst. denies frequent urination.
denies numbness. denies blurry vision.
denies heat/cold intolerance.

Psychiatric:

denies tension/stress. denies depression.
denies sleep disturbances. denies suicidal ideation.

ENT/respiratory:

no cold. no non-productive cough. no nose bleed. no hearing loss. no change in voice. no sore throat. no ringing in ears. no cough with exercise.
no nasal stuffiness. no snoring. no wheeze.
no sinusitis. no hoarseness. no ear pain.
no shortness of breath.

Assessments

1. ROUTINE MEDICAL EXAM - V70.0 (Primary)

Treatment

1. ROUTINE MEDICAL EXAM

Labs:Lipid Profile, Glucose, CBC, Urinalysis

Preventive Medicine

Counseling: Smoking . Alcohol and drugs . Diet . Exercise . Sexual practices .
Testicular self exam . Sunscreen .

Follow Up

1 Year

Examination

General Exam:

General appearance: mildly ill but in no acute distress, pleasant, well built and nourished, appears to be in comfortable. HEENT: clear rhinorrhea, pharynx and tonsils normal, TM's normal. Skin: normal. Neck: supple. Oral cavity: no lesions. Heart: RSR, no murmurs. Lymph: no adenopathy in, neck, axillae, groin. Lungs: clear to auscultation and percussion. Abdomen: no masses felt, no tenderness, no pulsatile lesions. Neurologic exam: no meningeal signs, no focal signs. Rectum: normal stool, no masses. Rectal: no masses, no blood in stool. Chest: normal shape and expansion, no tenderness on chest wall. Genitalia: normal exam, no masses.

Electronically signed by Sam Willis MD on 08/21/2008 at 04:01 PM EDT

Sign off status: Pending

Tel:

Patient: T, TEMPLATES DOB: 01/01/1970 Progress Note: Sam Willis, M.D. 01/01/2001
Note generated by eClinicalWorks EMR/PM Software (www.eClinicalWorks.com)

Assisting in the creation of a robust medical record, EMRs come with abundant checklists and vendor or user-customizable templates to ensure that all questions are asked, body systems checked, and relevant tests, procedures, diagnostic and therapeutic interventions are at least considered. These electronic screens may then present the information produced in a particular order, with graphical displays of patients' clinical results over time correlated with specific therapies, or in tandem with consultation, laboratory, and/or radiological findings. This virtually eliminates the tedious and error-prone process of hunting for the clinical highlights from the patient's previous visits. In addition, information and clinical findings from checklists generated during prior office

visits, including those previously checked “within normal limits” (WNL), may be easily viewed for comparative purposes.

Checklists may also be used in ordering laboratory (especially tissue pathology), radiological exams and referral/consultation requests. The supporting information needed for each of these requests may be auto-populated from data in the EMR itself, saving the time of culling this information from multiple paper-based records.

Certain EMRs allow for carrying forward information from one visit to the other, such as top conditions or previous notes, or the auto-population of “standard” notes for specific illnesses. They may also allow for “default” populating of WNL for review of systems. These features are intended to serve as time-savers, which if used properly can also assist in ensuring complete documentation, but they are not without risk that information now part of the current record could be inaccurate.

Be cautious with all of these features. They are wonderful features if used properly. When adopting any of them, give careful consideration to how they could be used against you in the future. And always consider that many of the same traditional risk management practices for good documentation must be applied with electronic records.

POTENTIAL PITFALLS
<ul style="list-style-type: none"> • <i>Opting too heavily for gaining efficiencies over improving patient safety and managing risk.</i> Balance is critical here. Careful consideration of all features will help ensure that many of the following pitfalls do not occur.
<ul style="list-style-type: none"> • <i>Default populating of check boxes with WNL (“within normal limits”).</i> Two significant issues with this feature are: 1) the EMR may populate an unintended field that does not get modified; and 2) the appearance of all or most of these boxes in the default (WNL) in most records may make a jury equate “WNL” with “We Never Looked.”
<ul style="list-style-type: none"> • <i>Inconsistencies between free text and checkboxes.</i> Checkboxes allow for rapid point and click or one-click for a group of boxes. Ensure that this does not lead to an inconsistency with what you write in free text, or at least be sure any inconsistency is explained. When using check boxes, always take the time to review the boxes at the end of the visit.
<ul style="list-style-type: none"> • <i>Inconsistencies between current findings and carry-forward information from a previous visit.</i> When using a feature such as this, you must ensure that ALL copied forward information is consistent with the patient’s current visit. As stated above, review all information at the end of the visit and before locking the record.

POTENTIAL PITFALLS

- ***Use of multiple physician templates.*** Although customization is a selling point with EMR vendors, allowing physicians in your office to use different templates (whose output of similar patient information also appears different) is a risky practice. Lack of familiarity with multiple templates has the potential to cause confusion, missed facts, poor assumptions, and less-than-optimal decision making by those (office staff and covering physicians) caring for your patients. Unless you are a multispecialty practice, in which case multiple templates across different specialists may be justified, physicians should strive to use the same or similar templates for collecting and recording patient information – at the very least among those physicians who may cross-cover for one another.
- ***Having a nurse complete a portion of the medical record history and physical and having that be inconsistent with the physician record.*** With EMRs' point-and-click ease, some offices have engaged a nurse, for efficiency, to capture key elements of the history and physical prior to the physician visit. It is critical that there are no unexplained inconsistencies between that indicated by the nurse and your note. This is similar to problems experienced by emergency departments that utilize triage nurses.
- ***The loss of critical patient information within an office by unchecking boxes.*** In situations where a staff member elicits information from a patient during an intake exam and checks a particular box, but the symptom or earlier reported history subsides by the time the physician sees the patient, physicians must be mindful of the risk of unchecking a box without some dialog with the staff person who originally checked the box. Not only does this present a potential patient safety issue (for not evaluating and treating a complaint made to a staff member), but it may increase the liability risk for both the physician and staff member, should the patient suffer a subsequent preventable problem. To avoid this potential, a policy should be established wherein boxes cannot be unchecked by another individual without first notifying the original box checker and clearly explaining in free text any inconsistencies between the providers' notes.
- ***Overuse of checkboxes.*** The sole use of checkboxes in documentation may create, in the eyes of jury, the impression of laziness. To prevent this impression, it is important for physicians to utilize the free text option to supplement check-off generated history and physical reports whenever possible.
- ***Auto-population for standard illnesses.*** Features are being created that could allow for standard findings or symptoms to auto-populate after a few key items are checked. For similar reasons listed with many of the issues above, this feature should be avoided.

b. Compilation of multiple sources of patient information (electronic and non-electronic)

Unless a physician is in a completely contained electronic health information network, much of the information in an EMR will be comprised of sources of patient information generated by both electronic and non-electronic means (but scanned into the EMR). The level of interoperability will determine the extent to which the information is electronic (defined as generated within the system and/or transferred electronically from one system to another) or non-electronic. In cases of low level of interoperability, EMRs still afford an advantage over paper records in that all documents can be scanned and attached to the record for easy access and reduced potential for loss.

NOTE: All importation of external records (such as electronic or non-electronic consultation reports, etc.) and other electronic or non-electronic documents (including medical journals) which can be scanned into a patient's EMR may be discoverable according to the latest Federal Rules of Civil Procedure (December, 2006). New Jersey courts (which oversee most medical liability actions here) have embraced these federal rules governing the discovery of electronic health information, including metadata (Korin, JB, Quattrone, MS, Electronic Health Records Raise New Risks of Malpractice Liability:

<http://www.law.com/jsp/legaltechnology/pubArticleLT.jsp?id=1182194746807>).

What is critical to note here is that you should be aware of how interoperable your system is and that you ensure that all relevant information is included in the EMR or at least considered in decision making. Assuming that the information available in the EMR is entirely complete, when in fact it is not, can lead to critical errors. You may assume that all lab results are being transferred electronically because of your relationship with the major vendors, and yet a specialty lab may not have that ability. Small pharmacies may pose the same issue.

c. Compiling information during the course of discovery

EMRs provide the ability to easily compile and retrieve information from records of patients with similar disease processes including information from patient registries, which are easily created in EMRs (note: patient registries are discussed further within the Clinical Judgment section). This was once an impossible or overly burdensome task. The ability to compile all pertinent data (electronic and non-electronic) about patients in one place very quickly, comprehensively, and easily is advantageous to you in the actual care of your patients. However, should litigation ensue, this easily retrievable information may highlight inconsistencies in documentation which, if not explained, may affect your ability to contend that a certain treatment course is your standard operating procedure in the care of similar patients. For this reason, complete and accurate documentation of care in all records is vitally important with EMRs.

d. Electronic footprinting (the generation of "metadata")

Electronic footprinting refers to the behind-the-scenes computer/system recording of every entry made to the record, when it was made (time and date) and by whom. This metadata (data about data) records information about entries, changes, and deletions (including instant messaging and emails) to/from the electronic record. This information remains available despite attempts to delete.

The ability of EMRs to produce this electronic footprinting has obvious advantages. The recording, timing and authentication of the authorship of every entry produces an auditable record which can remove all doubt concerning exactly what was entered, when

and by whom. Electronic footprinting may also become important when medical records are altered, since alterations to the EMR may be authenticated as to the author, the content of the change and exactly when the modification occurred. All users of the EMR need to be aware of the existence of metadata, and the potential for embarrassing discovery during a lawsuit.

POTENTIAL PITFALLS

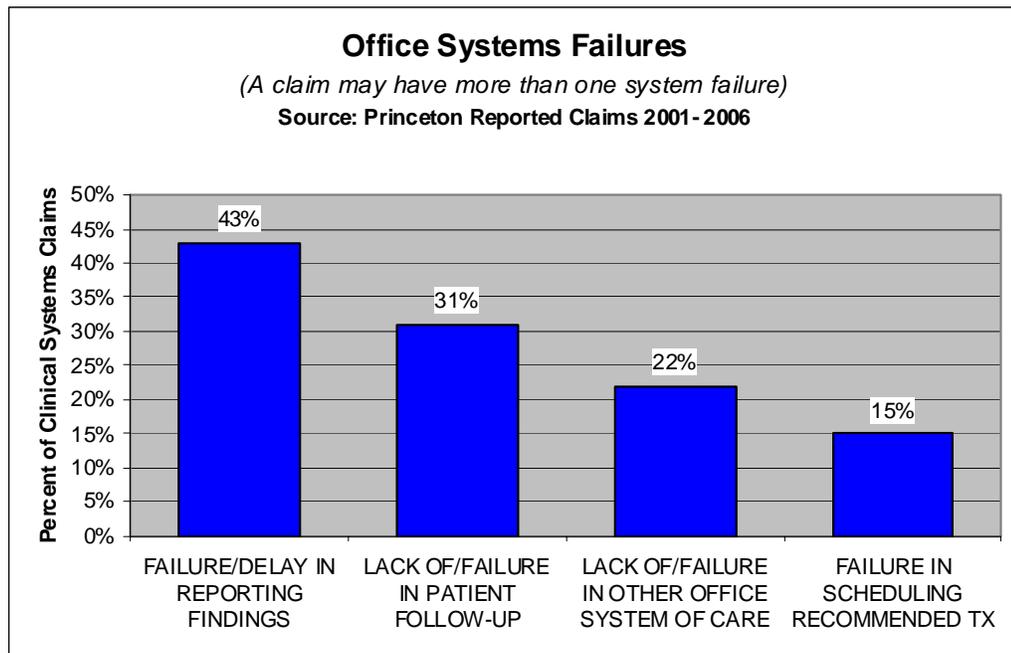
- ***Alteration of EMRs.*** Electronic or paper-based, alteration of medical records is always fraught with medicolegal risk if not done appropriately. It is all a matter of perceived motivation for the changes. In general, the more time that elapses from when the actual patient visit occurred and when the record was altered, the more suspect may be the changes that are made. The time-honored way of altering records (i.e. crossing out information to be changed with one horizontal line, identifying added information with date, time, and signature) is emulated in some EMR systems and is a feature that should be sought.
- ***Importation of medical journal articles covering topics relevant to the diagnosis and/or treatment of patients.*** Some parts of imported documents (especially footnotes) may contain information contrary to your clinical decisions. Should the patient suffer injury and become a plaintiff, this information, as part of the patient's EMR, is discoverable and may be used as evidence that the defendant physician did not read thoroughly the article(s) supporting his clinical decisions. Therefore, physicians should never incorporate such articles into patient EMRs until and unless they have thoroughly researched all the literature and include all relevant literature, including an explanation of their course of action.
- ***Not understanding the extent of interoperability*** (i.e. the ability to electronically transmit key elements of patient information between and among physicians, hospitals, laboratories, pharmacies, x-ray facilities, emergency departments). ***It is important for physicians and their staffs to know just how interoperable their EMRs are.*** For example, many cannot transmit to/from certain "mom-and-pop" pharmacies (or other facilities) even when they have what appear to be fully interoperable electronic prescribing programs. Also, unless they are part of a health information exchange or other electronically connected network, EMRs generally are not interoperable (yet) even with the hospitals and emergency departments which their patients may frequent between visits. ***The danger lies in assuming that your system is more interoperable than it is, leading to assumptions and actions that may negatively impact care because of a missing (non-communicated) piece of critical information. It is important for all physicians to know where they can transmit or receive electronic information and where they cannot.***

POTENTIAL PITFALLS

- ***EMRs staying open too long.*** Keeping records open long enough to incorporate late-breaking information (such as the results of lab or x-ray tests, or even referral/consultations) are touted by EMR vendors to physicians as a convenience feature. However, such a feature may be a liability risk if the period of time is unreasonably long. ***Any time that a medical record (electronic or non-electronic) may be kept open (i.e. unlocked) and thereby susceptible to alteration for any extended period of time raises the red flag of possible mischief-making. To overcome this pitfall, there should be a way of recording and authenticating in an auditable manner who alters the medical record, and how, during this period that the record remains open.***

C. Improving Office Practices and Clinical Systems

In addition to improving documentation, improving tracking and monitoring of patients' care, including testing, test results, visits, screening and treatment follow-up, are perhaps the most effective risk management tools offered by EMRs. All too often the correct care is prescribed, the most effective test is ordered, and appropriate follow-up is planned, only to have a simple systemic or procedural breakdown cause failure (see graph below for claims experience resulting from these issues).



Among the failures are:

- Test results/consultant reports being filed before the physician has reviewed them
- Test results/consultant reports not being delivered
- Test results with panic values that are not brought immediately to the attention of the physician
- Missed appointments for critical follow-up

- Preventative/screening guidelines not met, or monitoring test is not ordered because patient doesn't make appointment within timeline
- Patient non-compliance with recommendations for testing/follow-up*
- Prescription not filled by patient

**Patient failure to comply with recommendations, which ultimately leads to an adverse outcome, is a breakdown that has caused much debate within the physician community as to who bears ultimate responsibility. Despite that debate, the courts have increasingly placed the obligation of ensuring compliance (or documentation of attempts to do so) upon the physician.*

Used efficiently, the capabilities of EMRs to mitigate these systemic failures are considerable. We emphasize efficiency here. Many EMRs track very effectively and provide alerts and notices to assist in follow-up. However, to a physician who did not have an active system of tracking and patient notification pre-EMR, this can be overwhelming, as the system yields an avalanche of alerts and messages. Very careful attention is needed when entertaining the degree (sensitivity) to which any physician will implement alerts. In a perfect patient safety world you may want them all. From a risk management perspective you will want all that are critical, and perhaps some that are not, but a total volume that allows you to act on ALL that you receive.

1. Monitoring, Tracking and Following Up on Patients (Practice Management Alert Systems)

EMRs offer various types of alerts for physicians and office staff to utilize for follow up on patients to ensure that they are adhering to instructions, receiving prescribed medications, undertaking recommended tests and interventions, and making or keeping critical follow up appointments. Alerts can be provided and viewed in a variety of ways, dependent upon the EMR, but most place the notice in the physician's to do-list. Color-coding of the alerts indicates the level to which urgency is to be applied. These then remain tasks for accountable parties until they are completed and can trigger the activation of a systematic (and escalating) patient recall system (e-mails, faxes, automatic calls to the patient, etc.).

Some of these alerts to prevent patients from being lost to follow up include:

a. Missed appointment alerts

Whenever patients (especially those with conditions requiring close monitoring) miss appointments without prior notification, the practice management system (PMS) of an EMR provides alerts to their physicians and office staff.

b. Alerts for failure to obtain prescribed medications

Electronic prescribing programs in EMR systems can provide alerts to physicians and office staff when prescriptions for medications are not filled. All the leading ambulatory EMR systems can track whether or not a patient has gotten a prescription filled at a pharmacy whose electronic prescriptions are tracked by RxHub and/or Surescripts. However, this is dependent upon prescription plans' subscription to RxHub or Surescripts.

These EMRs can produce lists of all patients not filling prescriptions and then transfer this information into "to do" lists (see "Improving Intra-Office Communications" in the "Improving Communication" section) for physicians and office staff to follow up with these patients. Be aware that this will be effective only for those patients participating in a prescription plan and who utilize a pharmacy that is part of the EMR's E-Prescribing network. You can rely on information received regarding Rx's filled/not filled. However, you should not assume that you have ALL information for all patients.

c. Alerts for past due test or consultation results

Test/consultation results may be overdue because the patient did not comply with the recommendation, or the test/consultation results were lost in the mail or other media. EMRs typically account for tests and consultations ordered through the use of due dates. All tests/consultations ordered are assigned a due date, and failure to fulfill an action to account for that test by the due date will trigger an alert. This is a far more preferred methodology to the office practice of relying on patient inquiries, revisits, or the delivery of legal papers to determine that a test or consult was not fulfilled.

To the extent that an EMR system is interoperable with various laboratory and radiology or consultative information systems, it may alert physicians and their office staff when patients don't follow up with prescribed tests or interventions.

Overdue Orders

Date	Time	Patient Name	Patient ID	Order Name	Status	FVID	Order Set	Facility	Repeat
08/05/2007	9:58 PM	Childers, Adam	1108	Blood Culture (Routine/SBE)	Pending	RN1			
10/05/2007	9:28 PM	Smyth, Margaret	100-1	URINALYSIS	Pending	RN1		LABCORP	

Source: McKesson

d. Alerts for laboratory panic values

Interoperable clinical systems will also alert physicians if lab results come back which indicate a potentially life-threatening condition (e.g. a potassium reading over 6.0 or hemoglobin below 10.0 in a non-renal compromised patient). Even more urgent to-do lists and escalating communications to patient and their families may then follow. These laboratories (e.g. Laboratory Corporation of America, Quest Diagnostics, et al.) or radiology/imaging centers (free-standing or part of universities or corporations) must have allied with the particular EMR system to provide these alerts.

Lab Result Notification

Order Date	Coll Date	Result Date	Patient	Labs/Diagnostic Imaging	Reason	Result	AssignedTo
<input type="checkbox"/> 08/08/2008		08/07/2008	Smith, Joe	Urinalysis			Willis, Sam
<input type="checkbox"/> 08/07/2008		08/07/2008	Smith, KM	Urinalysis			Willis, Sam
<input type="checkbox"/> 08/01/2008		08/01/2008	Smith, Amie	Urinalysis		Normal	Willis, Sam
<input type="checkbox"/> 04/03/2008		04/03/2008	Smith, Trevor	Rapid Strep			Willis, Sam
<input type="checkbox"/> 03/28/2008		03/10/2008	Smith, Mary	Pregnancy Test Urine			Willis, Sam
<input type="checkbox"/> 03/27/2008		03/27/2008	Smith, Mary	ekg			Willis, Sam
<input type="checkbox"/> 03/19/2008		03/19/2008	Nelson, Jennifer	ekg			Willis, Sam
<input type="checkbox"/> 01/31/2008		11/21/2007	Doe, Jane	FBS			Willis, Sam
<input type="checkbox"/> 11/20/2007		11/20/2007	Jane, Amanda	FBS			Willis, Sam
<input type="checkbox"/> 08/22/2007		08/22/2007	Smith, Joe	Creatinine			Willis, Sam
<input type="checkbox"/> 08/06/2007	08/06/2007	08/06/2007	Smith, Jack	PPD		Scanned copy critical high	Willis, Sam
<input type="checkbox"/> 08/02/2006		10/17/2006	Smith, KM	ekg			Willis, Sam
<input type="checkbox"/> 07/07/2006		07/21/2006	Doe, Jane	Urine microalbumin			Willis, Sam
<input type="checkbox"/> 07/07/2006		07/21/2006	Doe, Jane	C-Peptide			Willis, Sam
<input type="checkbox"/> 05/24/2006		10/17/2006	Smith, Joe	ekg		Attached through Midmark	Willis, Sam
<input type="checkbox"/> 01/03/2006		07/21/2011	Doe, Jane	Lipid Test		High	Willis, Sam

Source: eClinicalWorks

Not knowing the results or actions taken and communicated to patients concerning lab, x-ray or consultation requests can be a major source of medicolegal risk. There are many cases in which information from outside the office between visits was not taken into account in time to make the difference in avoiding patient harm by changing a particular course of action.

Beyond alerts, EMRs may provide readily accessible, comprehensive, and printable logs of all outstanding information on patients. These logs include whether the results (especially potentially serious ones) of various tests have or have not been communicated to patients (including recommendations, where appropriate), in order for patients to take or modify actions.

Overdue Test Logs

The screenshot shows the eClinicalWorks Patient Recall interface. The main window title is "eClinicalWorks (Willis, Sam, MD)". The interface includes a navigation menu on the left with options like Admin, Practice, Recalls, Patient Recall, Lookup Encount..., Registry, Registry Reports, Referrals, Messages, Documents, and Billing. The main area is titled "Patient Recall" and contains search filters for Appointment Date, Patient, Protocol, All Labs/DI/Imm Alerts, Dx, and Rx. The Protocol is set to "Colonscopy". The Date(s) is "08/21/2008" and Due By is also "08/21/2008". Filter Patients options include Age, Sex, Deceased Only, and Inactive Only. The Date of Service Filter is from "01/01/2002" to "08/21/2008". Search Criteria is "Based on tests not ordered" and Rendering Provider is "All Providers". A "Lookup" button is present. Below the filters is a table of overdue tests:

	Patient	Test	DOB	Sex	Age	Home Phone	Last Done	Due Date	Last Visit	Next
<input checked="" type="checkbox"/>	A, Alan	Colonscopy	09/08/1967	M	40Y	508-836-2700	No Record	Now	04/01/2008	
<input checked="" type="checkbox"/>	A, Alan	Colonscopy	08/09/1967	M	41Y	508-836-2700	No Record	Now	03/28/2007	
<input type="checkbox"/>	A, Alan	Colonscopy	05/20/1977	M	31Y	508-836-2700	No Record	Now	10/09/2007	
<input checked="" type="checkbox"/>	A, Alessandra	Colonscopy	10/28/1966	M	41Y	508-836-2700	No Record	Now	04/20/2004	
<input type="checkbox"/>	A, Aletha	Colonscopy	12/25/1971	F	36Y	508-836-2700	No Record	Now	05/04/2004	
<input checked="" type="checkbox"/>	A, Alexis	Colonscopy	03/01/1972	F	36Y	508-836-2700	No Record	Now	05/11/2004	
<input type="checkbox"/>	A, Alicia	Colonscopy	06/18/1963	F	45Y	508-836-2700	No Record	Now	01/26/2004	
<input type="checkbox"/>	A, Craig	Colonscopy	07/12/1962	M	46Y	508-836-2700	No Record	Now	12/31/2003	
<input type="checkbox"/>	ALEC, George	Colonscopy	03/03/1960	M	48Y	555-555-5555	No Record	Now	07/20/2004	
<input type="checkbox"/>	Alex, Barry	Colonscopy	03/03/1960	M	48Y		No Record	Now	10/25/2004	
<input type="checkbox"/>	Alex, Cheka	Colonscopy	05/12/1967	M	41Y	555-555-5555	No Record	Now	09/06/2004	
<input type="checkbox"/>	Alex, Erin	Colonscopy	03/03/1967	F	41Y	555-555-5555	No Record	Now	10/25/2004	
<input type="checkbox"/>	Alex, Jen	Colonscopy	03/03/1975	F	33Y		No Record	Now	10/14/2004	
<input type="checkbox"/>	Alex, Matt	Colonscopy	03/03/1967	M	41Y		No Record	Now	10/25/2004	
<input type="checkbox"/>	Alex, Peggy	Colonscopy	04/04/1975	F	33Y		No Record	Now	11/11/2004	

Source: eClinicalWorks

The screenshot shows the Practice Partner Patient Records and Appointment Scheduler interface. The menu is open, showing options like Patient Registration, Missing Progress Notes, AS/PR Referrals, Patient Inquiry, Data Export, PDA Export, Patient Records, Schedule Reports, Orders, Logon Audit, and Audit Trail. The Orders menu is expanded, showing Standard Orders, Custom Orders, Overdue Orders, and Order Analysis. Below the menu is a table of overdue test orders:

Date Overdue	Date Ordered	Ordered By	Patient Name	Type
Time Overdue	Time Ordered	Name of Order	Patient ID	Status
Clinic		Facility		
08/06/2007	08/05/2007	NANCY DEAN	Childers, Adam	
12:00:00 AM	9:58:00 PM	Blood Culture (Routine/S	1108	Pending
CON				
10/16/2007	10/05/2007	NANCY DEAN	Smyth, Margaret	
12:00:00 AM	9:28:00 PM	URINALYSIS	100-1	Pending
CON		LABCORP		

Source: McKesson

2. Screening and Preventive Health Reminders

Screening test recommendations are embedded into most of the leading ambulatory EMR products. They include (among other things) preventive health screenings most appropriate based on a patient's age, gender, health status, and other factors. EMR clinical systems also keep track of all the screening tests that have been completed on patients as well as when the next ones will be due. The EMR effectively tracks the status of preventative care requirements for patients regardless of whether the patient has been seen in the office or not, closing a potentially significant care gap by permitting underlying, potentially serious conditions to be detected in their most treatable state.

Health Maintenance Protocol Due Dates

Health Monitor: Set Health Maintenance Protocols		Set Disease Management Protocols	
	Due:		Due:
Physical Exam	03/28/2006	Tetanus	07/01/2008
Lipid Panel	07/01/2008	PSA Test	11/03/2004
Colonoscopy	07/01/2008	Eye Exam	07/01/2008
Sigmoidoscopy	//	Foot Exam	07/01/2008
FOBT x3	//	HgbA1C	07/01/2008
Influenza Vac	09/15/2005	BMP Fasting	//
Pneumo Vac	09/15/2014	EKG	//
		Stress Test	//
		Echocardiogram	//
		ALT/AST	//
		CPK	//
		Urinalysis	//
		Urine Micro	//
		TSH	//
		PFT	//
		Chest X-ray	//

Source: NextGen

Preventive health templates may also include reminders for specific groups of patients (including the young, elderly, and healthcare workers) to obtain certain vaccinations, including, but not limited to:

- All types of cancer screenings (e.g. breast, cervical, prostate, colorectal)
- Cholesterol (all types) and triglyceride screening, blood sugar screening (including glucose tolerance tests)
- Blood pressure screening
- Bone densitometry for post-menopausal women
- All vaccinations for children (including chickenpox and meningitis); pneumonia and influenza vaccines for children, those over 50 and healthcare workers
- Hepatitis vaccine for healthcare workers

Health Maintenance Protocol Past Due Summary by Patient

	Recommend For	Due (seq.#)	08/06/2008	08/05/2008	08/01/2008	08/01/2008	08/01/2008	08/01/2008	08/01/2008	08/01/2008	11/11/200
Alcohol	Multiple	08/02/2009			X*						
Aspirin Therapy	Multiple	08/01/2009			X						
BP	Multiple	02/03/2009	X	X	X	X	X	X	X	X	X
Cholesterol	Multiple	11/10/2008									X
Colonoscopy	50-64 YEAR OLD FE	07/26/2017									
Creatinine	HYPERTENSION	11/10/2008									X
Depression	50-64 YEAR OLD FE										
Diet Counseling	Multiple	11/10/2008									X
Exercise Counsel	Multiple	11/10/2008									X
Eye exam	DIABETES MELLITU	11/11/2008									X
F.O.B	50-64 YEAR OLD FE	07/25/2008									
Flex Sig	50-64 YEAR OLD FE	07/26/2012									
Foot Exam	DIABETES MELLITU	08/01/2009			X						
Glucose Fasting	Multiple	07/26/2008									
HDL Cholesterol	Multiple	07/25/2008									
Height	50-64 YEAR OLD FE	08/06/2013	X	X	X	X	X	X	X	X	X
Hemoglobin A1C	DIABETES MELLITU	04/10/2008									
Influenza vaccine	Multiple	07/26/2008									
LDL Cholesterol	Multiple	07/26/2008									
Mammogram	50-64 YEAR OLD FE										
Microalbumin, Ur	DIABETES MELLITU	11/10/2008									X
Pap Smear	50-64 YEAR OLD FE	10/29/2003									
Pneumococcal poly.	DIABETES MELLITU										
Smoking Counseling	Multiple	07/25/2008									

Source: McKesson

Health Maintenance Protocol Past Due Summary by Practice

Health Maintenance Rule Summary						
Thursday, July 31, 2008						
All Patients						
Patient	MRN	DOB	Address	Phone	Due Date	Referring Provider
PSA Routine Test						
Grant, Mark		05/31/1952	500 Main Street Los Gatos CA 95030	(250)679-8887	04/17/2008	
Atkinson, Gene		09/24/1939	6204 Green St Raleigh NC 27614	(919)454-8000	04/17/2008	
Nadie, Don	1102	05/01/1940			04/17/2008	
Heart, Jacob		11/28/1945	111 Ashe Dr Raleigh NC 27614	(919)329-1000	04/17/2008	
Schweber, Phillip		01/30/1939	8529 Beagles Landing Dr Tampa FL 33606	(813)555-6009	04/18/2008	

Source: Misys

Preventive Health Reminders to physicians concerning their patients' need and timing for these and other screenings and vaccinations should not unduly interfere with clinical process workflow. These reminders provide helpful ways of tracking a patient's completion of these necessary preventive health screening tests not only to maintain their health, but also to prevent future claims of neglect should failure to do these ever result in adverse outcomes which become the subject of litigation. However, the very nature of these reminders can pose a liability issue if not acted upon timely. This may be a particularly significant issue if you

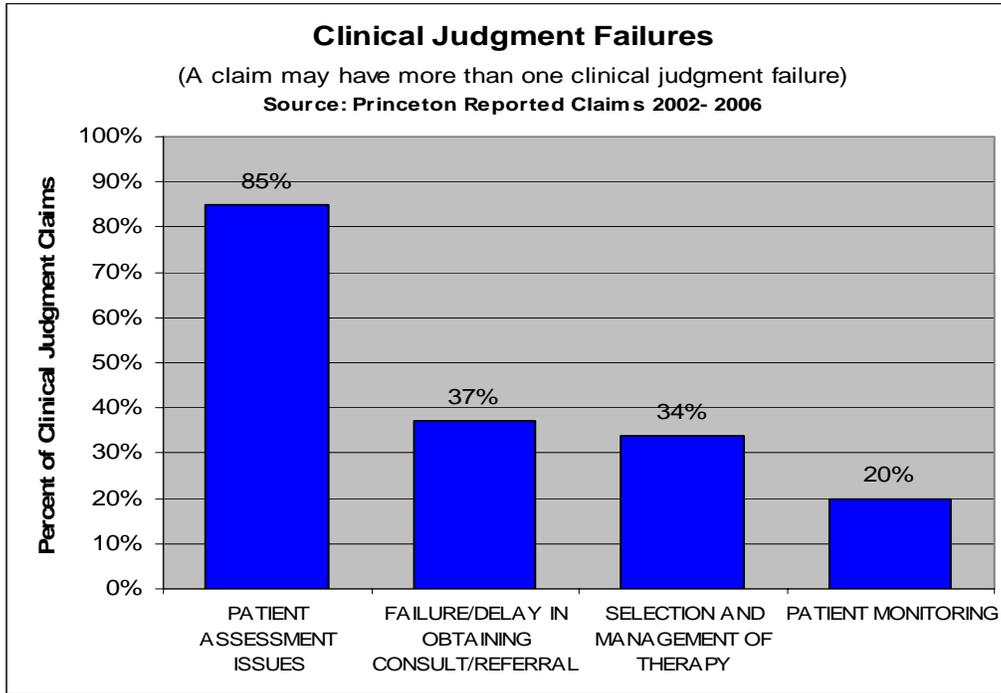
see a patient after the notice and you fail to inform the patient at the time of the visit. Regardless of the reason for a patient visit, ensure that you check for alerts or reminders that may exist at the time of the visit, advise patients appropriately, and document the advice given.

POTENTIAL PITFALLS
<ul style="list-style-type: none"> • <i>Alert or reminder fatigue.</i> Alert or reminder fatigue may afflict even the most conscientious physicians trying to maintain a busy practice. This fatigue may result in missed opportunities to improve the health of the patient. Constant clinical alerts and reminders may distract and interfere with clinical process workflow if the threshold for their triggering is set too low. The challenge for physicians is how to set the thresholds to screen out enough of these alerts and reminders to maintain clinical process workflow without risking missing something which could make a positive difference in their patients' care. <i>This needs to be an informed decision and should include consideration of resources required to respond to <u>all</u> alerts.</i>
<ul style="list-style-type: none"> • <i>Desensitization to the alerts.</i> Somewhat similar to alert fatigue, desensitization refers to receiving a steady stream of alerts that you don't consider critical, and it causes you to ignore some or all similar alerts, which may be critical. Unlike alert fatigue, however, this pitfall may not include a high volume of alerts. For example, a nephrologist receiving a steady, although not necessarily voluminous, stream of creatinine levels that barely exceed 2.0, can miss a subsequent critical value because of desensitization. <i>Again, careful consideration should be given to setting trigger levels to ensure that you respond to <u>all</u> alerts.</i>
<ul style="list-style-type: none"> • <i>Ignoring or overriding drug safety or laboratory results alerts.</i> By setting drug safety or laboratory results alerts at a threshold where they trigger too readily, physicians may be held accountable for following up on the suggestions deriving from these alerts. They may need to justify why they chose to override or ignore those alerts which either didn't make sense, or which could have been disregarded due to unique patient care factors, or where the benefits of changing course were dubious. Jurors may well look even less kindly upon defendant physicians who knew of possible adverse reactions (through alerts) but didn't change course, than they would upon those physicians not so alerted. <i>The best advice is to have clearly documented your justification for setting the thresholds where you did. You would need also to be able to state why in your best clinical judgment you were comfortable in not responding to alerts based on the patient's unique characteristics and overriding need for specific types of therapies.</i>

D. Improving Clinical Judgment and Outcomes

Not surprisingly, clinical judgment is implicated in more claims than any other factor, most specifically regarding patient assessment and treatment decisions (see graphic below). Improving clinical judgment and outcomes is perhaps the most ambitious of the EMR goals as appropriate clinical decision making is in large part a direct attribute of a physician's medical acumen. EMRs enhance this acumen through features that validate a physician's diagnostic impression or suggest

alternatives. Furthermore, through readily accessible best practice guidelines and Rx alerts, they can guide therapeutics or prevent potential errors from occurring.



Notwithstanding these benefits specifically intended for enhancing clinical judgment, recall our previous discussion about the interrelated and interdependent nature of the features of EMRs. The many benefits discussed in sections on communications, documentation, and office systems all support improved clinical decision making. However, other than the discussion about easily aggregated information at the point of care, those additional benefits are not reiterated in this section. We focus the EMR benefits and pitfalls in this section into three parts, including diagnostic and therapeutic decision support, and outcomes tracking.

1. Improving Diagnostics

Used properly, EMRs can greatly enhance diagnostic decision-making. This clinical skill encompasses one's ability to capture and process as much information as possible and to apply widely accepted clinical rules to determine quickly and accurately the underlying cause of the patient's chief complaint and other symptoms. The following features may help physicians in this important area.

a. Aggregation of complete, accurate and timely patient information in real time at the point of care

As previously mentioned, one of the great benefits of electronic records is their ability to aggregate complete, pertinent, accurate, and timely patient and patient-related information to facilitate optimal clinical decision making at the point of care. One of the most significant advantages is the ability to access this information remotely.

EMRs allow for the organization of the medical record information to better support comprehension. By compiling into useful graphical formats shown as part of a continuing care record (CCR), it makes it so much easier for a physician to evaluate quickly and accurately. Additionally, EMR systems permit a degree of customization in the manner in which patient information may be assembled and displayed to optimally support each

physician's thinking process – which is fine, as long as this customization does not produce unintelligible displays to others who may contribute to the patient's care. The following screen shots reveal a few options to displays of information.

Summary Data

Record Date | **Information Type** | **Remark** | **Status** | **Description**

6/17/2008 2:57:39 PM	Active Problem			
4/16/2008 12:32:30 PM	Current Medication			
6/17/2008 2:57:39 PM	Medical History			
7/31/2008	Health Maintenance Reminders			

Active Problem | [Return To Top](#)

Status	Diagnosis	TimeFrame	Comment	Record Date
Active	(530.81) - C - ESOPHAGEAL REFLUX			6/17/2008
Active	440.9 ATHEROSCLEROSIS UNSPEC			4/17/2008
Active	413.9 ANGINA PECTORIS OT/UNSPEC			4/17/2008
Active	401.1 BENIGN HYPERTENSION			2/16/2007
Active	Cholecystitis			2/16/2007

Current Medication | [Return To Top](#)

Lotensin HCT 10 mg-12.5 mg Tab; 1 Tablet(s); PO; daily; Qty: 30, associated to (401.1) - C - HTN; take 1 tablet by oral route once daily
 Prilosec 20 mg Cap; PO [6/17/2008 - ?]

Medical History | [Return To Top](#)

Status	Diagnosis	TimeFrame	Comment	Record Date
Active	(530.81) - C - ESOPHAGEAL REFLUX			6/17/2008
Active	440.9 ATHEROSCLEROSIS UNSPEC			4/17/2008
Active	413.9 ANGINA PECTORIS OT/UNSPEC			4/17/2008
Active	401.1 BENIGN HYPERTENSION			2/16/2007
Inactive	780.4 DIZZINESS AND GIDDINESS			2/16/2007
Active	Cholecystitis			2/16/2007

Health Maintenance Reminders | [Return To Top](#)

Rule	Due Date
PSA Routine Test	Possibly due/overdue- no last performance date established
Flu Shot	Possibly due/overdue- no last performance date established

Source: Misys

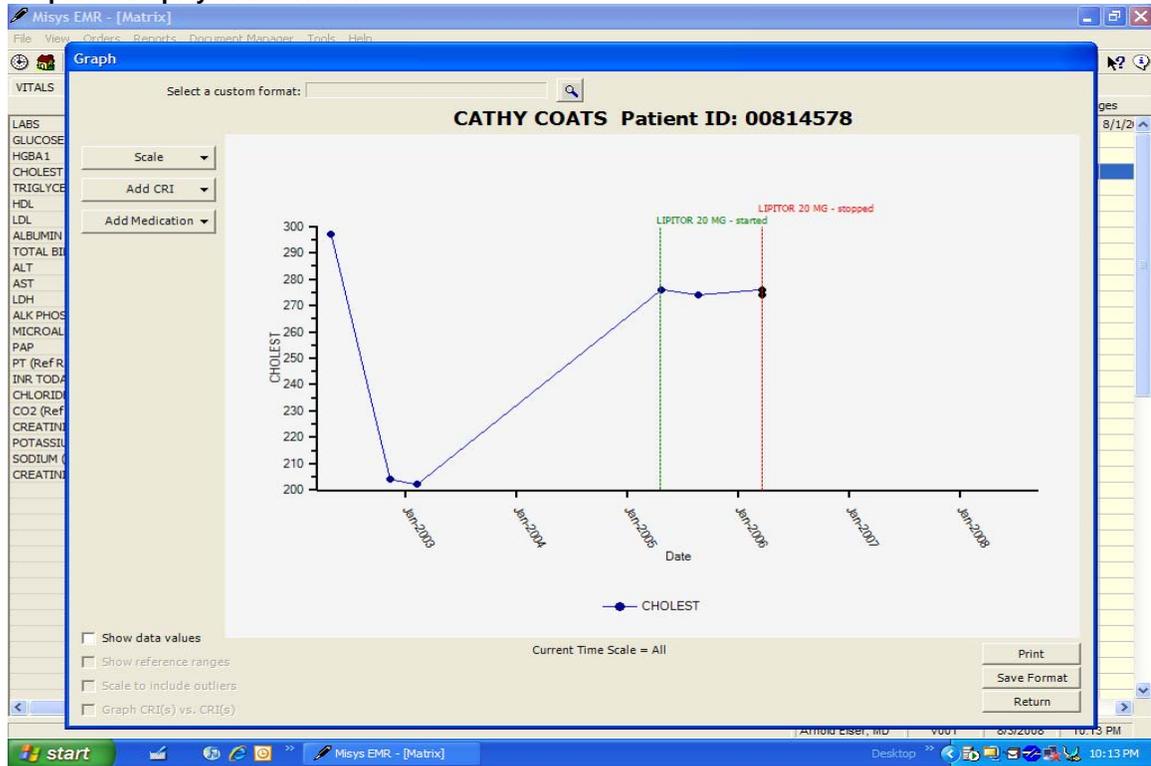
Flow Chart

Template: HYPERTENSION | Date

	05/21/08	04/23/08	03/26/08	02/13/08	01/30/08	01/16/08	12/19/07	11/26/07	10/10/07	10/08/07
Weight	266 lbs	269 lbs		266 lbs		269 lbs				270 lbs
BODY MASS INDEX	39.32 kg/m2	39.76 kg/m2		39.32 kg/m2		39.76 kg/m2				39.91 kg/m2
Systolic	120	117	135	121		143				145
Diastolic	80	82	88	84		90				92
ZOCOR										
CHOLESTEROL										
POTASSIUM										
CREAT										
GLUC, FASTING										
LDL-CHOL										
HDL-CHOL										
HYDROCHLOROTHIAZIDE	25mg daily	25mg daily	25mg daily	25mg daily	25mg daily	25mg daily	25mg daily	25mg daily	25mg daily	25mg daily
PROPRANOLOL HCL										
AMLODIPINE BESYLATE	5mg daily	5mg daily	5mg daily	5mg daily	5mg daily	5mg daily				
BENICAR	40mg daily	40mg daily	40mg daily	40mg daily	40mg daily	40mg daily	40mg daily	40mg daily	40mg daily	20mg daily
CLONIDINE HCL										
PRAZOSIN HCL										
Diet Counseling										
Exercise Counsel										
Substance Abuse Co										
PLAN OF CARE-HTN										

Source: McKesson

Graphical Display of Lab Results



Source: Misys

b. Differential diagnosis generation systems

These systems are found in a few of the leading ambulatory EMR systems. They have been around as research and educational tools for decades. When turned on, they can produce for physicians various differential diagnoses to consider (and rule in or rule out) based on the input of certain historical, clinical and pathologic (laboratory and X-ray/imaging) findings. Some of the more recent systems have been shown to suggest the final diagnosis in 95 to 98% of real cases in multi-center clinical studies (*Isabel: a Web-based Differential Diagnostic Aid for Pediatrics: Results from an Initial Performance Evaluation. Archives of Diseases of Childhood, May 2003*).

Radiology/imaging differential diagnostic systems embedded in a few of the leading EMR systems may even suggest which studies may improve the physician's pre- to post-test probability of a suspected diagnosis to the greatest extent. These embedded radiology information systems (RIS) may also caution against use of certain procedures based on a patient's condition and known hypersensitivities (e.g. to certain radiographic dyes). They may even caution against certain studies due to their radiation dosage (where a patient's cumulative lifetime dosage may be downloadable from his EMR).

Differential diagnostic generation systems (despite their long history and relative accuracy) are still seldom used by physicians. They have found their greatest usage in research and educational settings, especially to teach medical students and resident physicians about a wide variety of less well-known disease entities which may need to be considered when more likely diagnoses cannot be effectively ruled in or out.

The benefits of the use of these systems should be weighed heavily against your ability to respond to all of the differential diagnoses provided. Similar to alerts previously discussed, not responding to the potentials can create a difficult defense should a suggested possible diagnosis, which was not entertained by the physician, turn out to be

the actual diagnosis. At the very least, you should be prepared to state in the medical record why you did not believe that the alternatives suggested should be considered. Should you opt for this type of tool, make sure that all physicians who will utilize the system are aware of its existence and that they carefully consider the recommendations generated.

POTENTIAL PITFALLS
<ul style="list-style-type: none">• Data overload. Not unlike alert fatigue, the data derived from heeding differential diagnosis generation systems may result in too much information to process effectively, resulting in a failure to act appropriately.
<ul style="list-style-type: none">• Not acting on the output of differential diagnosis systems. Consider the case of one physician user of an EMR system who ignored the diagnostic possibility of a dissecting aortic aneurysm suggested by the symptoms fed into the EMR from a 27-year-old, otherwise healthy man. When that patient subsequently died of just such an aneurysm, the plaintiff's attorney and medical expert demonstrated how the EMR the defendant physician had used suggested that very diagnosis. Document justifications at the time of decision-making if you choose not to consider a serious, but unlikely, potential diagnosis suggested by one of these systems.

2. Improving Therapeutics

The leading ambulatory EMR systems are heavily invested in various types of software to improve therapeutic decision-making through the provision in real time of best evidence based medical practices. Many groups also incorporate leading edge health and disease management templates into EMRs to assist in the management of patients with specific, common chronic diseases, such as diabetes, asthma, congestive heart failure, arthritis, and a host of others. These guidelines are constantly updated by dozens of leading groups, including many medical specialty and subspecialty societies, as a way of ensuring optimal care to patients.

However, physician EMR users may either ignore or override these guidelines for a variety of reasons. **This is among the most important areas involving the installation and proper use of EMRs where it is critical to document the rationale for actions taken.** These actions (or inactions) may well have a significant impact on patient safety, quality of care and liability risk.

a. Best practice guidelines (by specialty and condition)

Most of the leading ambulatory EMR systems have embedded within their software best evidence-based practices. These best evidence-based practices derive from general guidelines groups like First Databank, Up to Date, Dynamed, MD Consult, Zynx Health Solutions, Rand, and www.guidelines.gov, among many others. There are also specialty and condition-specific guidelines, which can be “baked into” the EMR software from various medical and surgical specialty and subspecialty societies, including the American College of Physicians, American College of Cardiology, American Academy of Pediatrics, American College of Obstetrics and Gynecology, the American Academy of Family Practice, and a host of others.

Guidelines

home.practicepartner.html

Source: McKesson

Guidelines by Condition:

Allergy and Immunology	Musculoskeletal Disease
Cardiovascular Disease	Neonatology
Dental Disease	Nephrology
Dermatology	Neurology
Digestive Disease	Nutrition and Metabolism
Ear, Nose and Throat Disease	Obstetrics
Endocrine Disease	Oncology
Gynecology	Ophthalmology
Health Promotion/Disease Prevention	Poisonings
Hematology	Pulmonary Disease
Infectious Disease	Trauma
Mental Disorders	Urology

table-cardiovascular disease.htm

Source: McKesson

Cardiovascular Disease

Disease	Practice Guidelines
Anticoagulation: general	<p>Web:</p> <ul style="list-style-type: none"> Anticoagulation therapy supplement (ICSI, 2006)
Aortic aneurysm & dissection	<p>Web:</p> <ul style="list-style-type: none"> Acute chest pain - suspected aortic dissection (ACR, 2005) Aortic aneurysm and dissection (Finnish Med Soc, 2004) Pulsatile abdominal mass (ACR, 2005)
Arrhythmias (non-atrial fibrillation)	<p>Web:</p> <ul style="list-style-type: none"> Implantation of cardiac pacemakers and antiarrhythmia devices (J Am Coll Cardiol, 2002)
Atrial fibrillation	<p>Web:</p> <ul style="list-style-type: none"> Atrial fibrillation (ICSI, 2004) Antithrombotic therapy in atrial fibrillation. (Seventh ACCP Consensus Conference on Antithrombotic Therapy 2004) Management of newly detected atrial fibrillation (Ann Intern Med, 2003) Management of patients with atrial fibrillation (AHA, ACC, ESC, 2001)
Coronary Heart Disease	<p>Web:</p> <ul style="list-style-type: none"> 10-year heart attack risk calculator (NHBLI, 2001) Acute chest pain - suspected myocardial ischemia (ACR, 2005) AHA dietary guidelines (Circulation, 2000) Antithrombotic agents in coronary artery disease. (Seventh ACCP Consensus Conference on Antithrombotic Therapy 2004) Antithrombotic therapy in patients undergoing percutaneous coronary interventions. Seventh ACCP Consensus Conference on Antithrombotic Therapy 2004) Antithrombotic therapy in patients with saphenous vein and internal mammary artery bypass grafts. (Seventh ACCP Consensus Conference on Antithrombotic Therapy, 2004) A aspirin for the primary prevention of cardiovascular events: recommendations and rationale (USPSTF, 2002) Chronic chest pain-suspected cardiac origin (ACR, 2006) Coronary artery bypass graft surgery (ACC/AHA, 2004) Diagnosis and treatment of chest pain and acute coronary syndrome (ICSI, 2006) Differential diagnosis of chest pain (Finnish Medical Society, 2004) Evaluation and management of patients with non-ST-segment elevation acute coronary syndromes (Ann Emer Med, 2006) Evaluation of primary care pts. with chronic stable angina (Ann Int Med, 2004) Exercise and physical activity in the prevention and treatment of atherosclerotic cardiovascular disease (Circulation, 2003) Exercise testing (ACC/AHA, 2002) Intravenous thrombolysis and adjuvant therapy in acute MI (Seventh ACCP Consensus Conference on

The screenshot shows a web browser window with the address bar displaying "http://www.guideline.gov/summary/summary.aspx?view_id=1&doc_id=8289". The page header includes the National Guideline Clearinghouse logo and the AHRQ logo. A navigation menu contains links for "hide menu", "Guideline Syntheses", "Submit Guidelines", "What's New", "Contact Us", "About", "Site Map", and "Help".

The main content area is titled "Brief Summary" and includes the following sections:

- GUIDELINE TITLE:** Acute chest pain - suspected aortic dissection.
- BIBLIOGRAPHIC SOURCE(S):** Gomes AS, Bettmann MA, Casciani T, Grollman JH, Holtzman SR, Polak JF, Sacks D, Schoepf J, Stanford W, Jaff M, Moneta GL, Expert Panel on Cardiovascular Imaging. Acute chest pain--suspected aortic dissection. [online publication]. Reston (VA): American College of Radiology (ACR); 2005. 5 p. [30 references]
- GUIDELINE STATUS:** This is the current release of the guideline. It updates a previous published version: Gomes AS, Bettmann MA, Box LM, Grollman J, Henkin RE, Higgins CB, Kelley MJ, Needleman L, Pagan-Marín H, Polak JF, Stanford W. Acute chest pain--suspected aortic dissection. American College of Radiology. ACR Appropriateness Criteria. Radiology 2000 Jun;215(Suppl):1-5. [28 references]. The appropriateness criteria are reviewed annually and updated by the panels as needed, depending on introduction of new and highly significant scientific evidence.

A prominent red banner across the middle of the page reads: **** REGULATORY ALERT ****

Below the banner, the "FDA WARNING/REGULATORY ALERT" section states: "Note from the National Guideline Clearinghouse: This guideline references a drug(s) for which important revised regulatory and/or warning information has been released." A bullet point indicates: "May 23, 2007, Gadolinium-based Contrast Agents: The addition of a boxed warning and new warnings about the risk of nephrogenic systemic fibrosis (NSF) to the full prescribing information for all gadolinium-based contrast agents (GBCAs)."

At the bottom of the page, a section titled "BRIEF SUMMARY CONTENT" is visible.

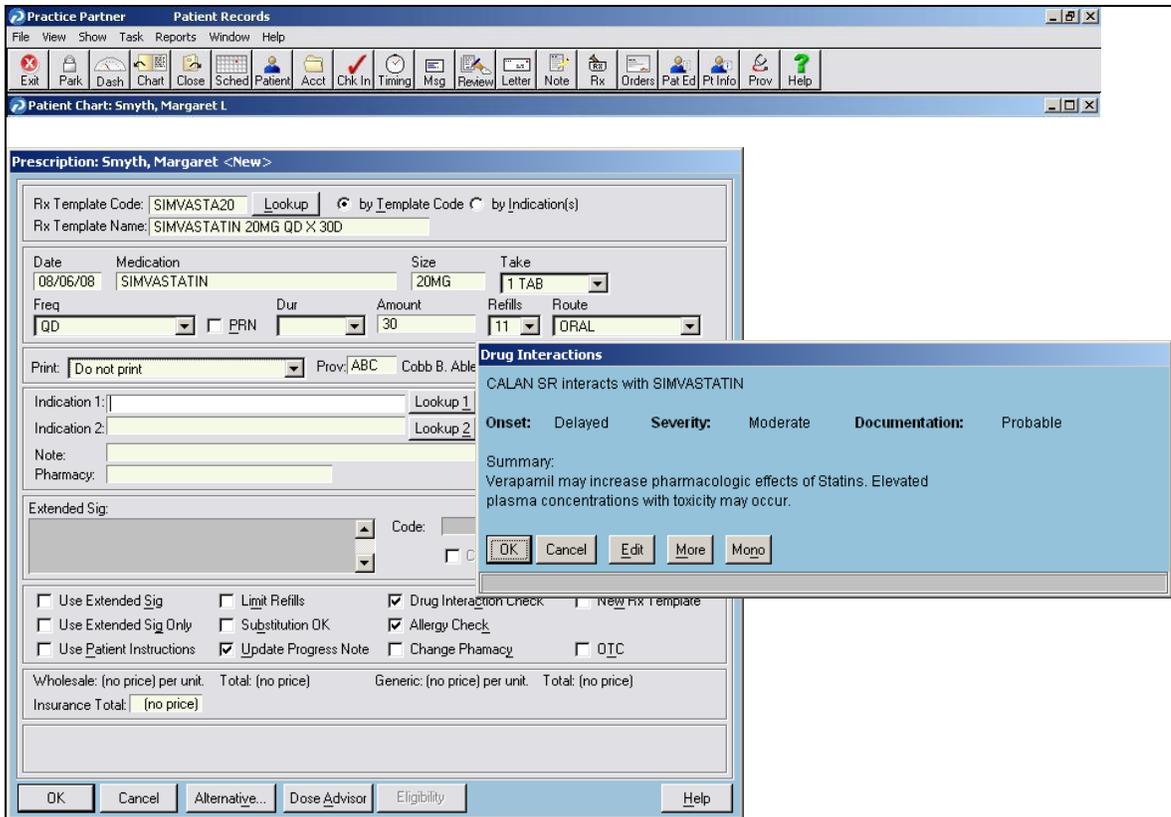
Source: McKesson

Physicians using EMR software that have these guidelines are not obliged to follow them. They are available to guide therapeutic decision-making when consulted. Note, however, that many EMR systems can keep track of physicians' relative adherence to these guidelines and even benchmark their performance locally, regionally and nationally, at least among other physician users of the same EMR systems—see the section below on Outcomes Tracking and Management Systems.

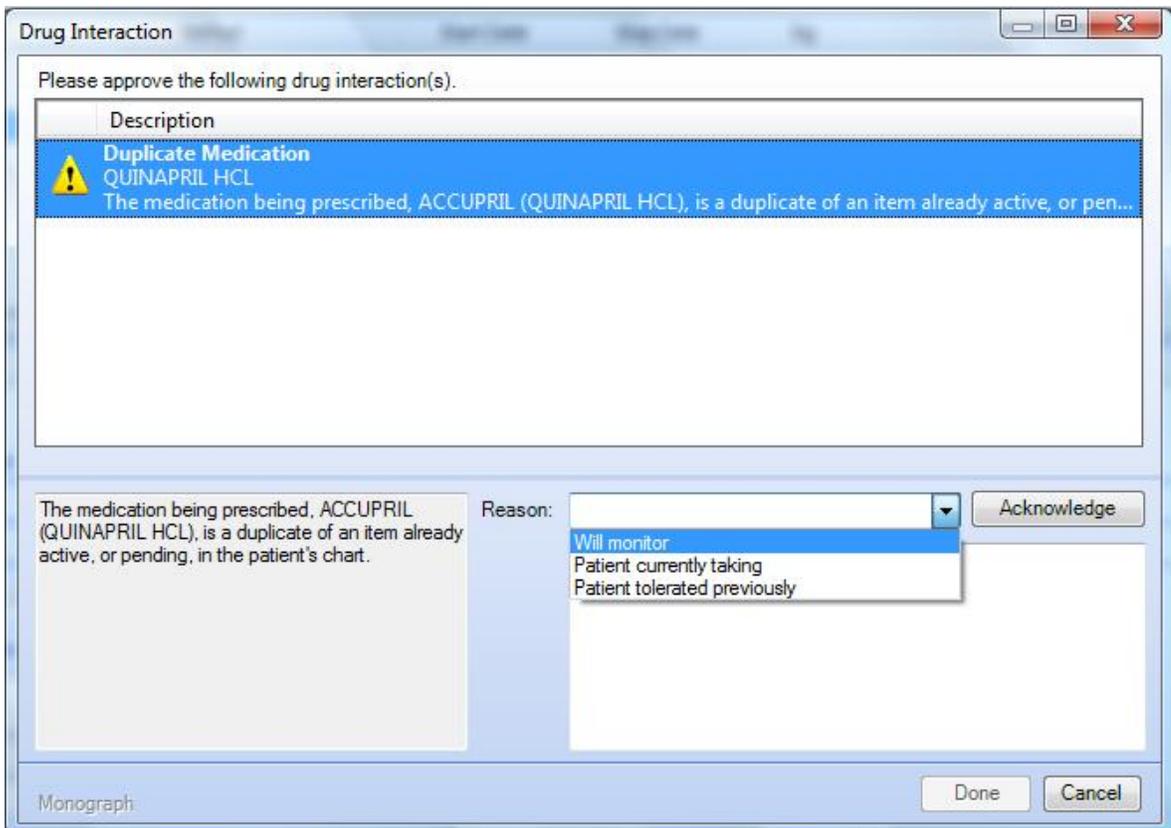
b. Medication prescribing alerts

Leading ambulatory EMR products have medication error prevention alerts embedded within their electronic prescribing capabilities. Used properly, these alerts can significantly aid in the clinical decision process and are a great enhancement to patient safety and risk management efforts. Interactions may be classified as mild, moderate, or severe (life-threatening) reactions. Physicians may adjust the triggers for these adverse reaction alerts for one, two, or all of these different levels of severity, ensuring that the alerts are appropriate for the physician/practice and reducing the likelihood of alert fatigue, with a resulting failure to act. Some key functionalities include alerts for:

- (1) **Drug-Drug Interactions**, a feature preventing the prescribing of one drug that may adversely interact with another (including duplicates), may decrease another's therapeutic effects, or dangerously increase them to toxic levels and/or otherwise cause untoward complications. It is important to note that this feature is effective only to the extent that the record reflects ALL drugs taken by the patient, including OTC supplements, and not just those prescribed by you.

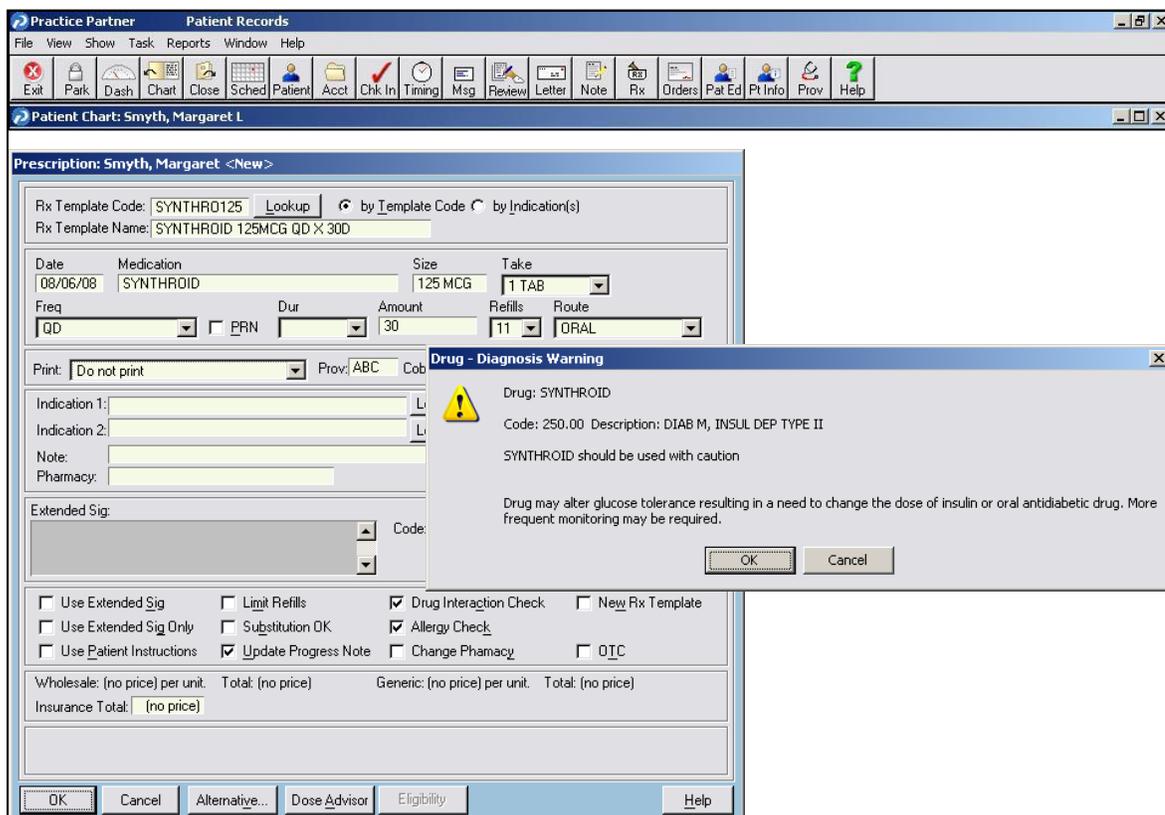


Source: McKesson



Source: NextGen

- (2) **Drug-Disease Interactions** -- Triggering an alert to prevent possible adverse reactions to certain prescribed medications in patients with specific diseases and conditions. In some cases of those patients with renal compromise, this functionality may provide guidance concerning safe “renal dosing” to prevent toxicity.



Source: McKesson

- (3) **Drug-Food Interactions** -- While somewhat less common, this is a feature most useful in patients with dietary requirements containing foods that could interact adversely with prescribed medications, as long as physicians have recorded diet information into the EMR.
- (4) **Drug Overdosing/Under Dosing** -- A feature found in some of the latest versions of EMRs containing algorithms, which may alert physicians to possible overdosing (or under dosing) due to such factors as patient age, body size, kidney or function, or even drug distribution and absorption rates.
- (5) **Drug Allergies** -- To the extent that these are known and recorded in the patient’s EMR, this function would prevent (or at least warn against) the ordering of medications which could trigger allergic or known hypersensitivity reactions.
- (6) **Contraindicated Drugs** -- May be identified through a color-coding system, signifying whether prescribed drugs are relatively or absolutely contraindicated.
- (7) **Drug/Laboratory Value Precautions and “Panic Value” Alerts** -- Triggered if a patient is prescribed a medication which could further aggravate a metabolic condition reflected by worsening lab results.

POTENTIAL PITFALLS

- ***Not knowing the limitations of best practice guidelines and alerts.*** Finally, physicians should not assume that there are necessarily guidelines in place in systems which aren't really there (e.g. those to prevent giving medications to children which may be absolutely or relatively contraindicated). If these EMR systems are not enhanced further to account for each patient's unique physiology to absorb and metabolize certain medications, even some of the so-called "latest" EMRs' clinical decision support systems may not be able to protect physicians from overdosing patients. ***To overcome this potential pitfall, physicians must be aware of what clinical decision support capabilities their EMRs have, and which ones they don't have.***

3. Process and Outcomes Tracking and Management

This is a feature which many leading EMR companies have embedded in their ambulatory products. To the extent that information from them can be stored in an electronic database, these EMR products may well be able to track physicians' performance and their patients' clinical outcomes in some or all of the following ways:

a. Tracking of physicians' following of best practice guidelines

Many of the leading EMR systems can keep track of their physician users' percentage adherence with best practice guidelines and disease/health management protocols. These systems may benchmark physician EMR user adherence relative to that of other physician EMR users of the same system regionally and nationally. Physician users need to ensure that their lack of adherence with best practice guidelines or health/disease management protocols is not counted against them if they document justifiable reasons for not adhering.

b. Tracking of the rate of physicians' recommending to patients screening and preventive health maintenance interventions when due

Similarly, most of the leading EMR systems can also track the rate of physician EMR users' recommending of the screening and preventive health maintenance guidelines to their patients (when it is timely and appropriate for them to do so). The same caveats in tracking adherence by both patients and their physician EMR users with these guidelines apply as did in tracking physician adherence with best practice guidelines and disease/health management protocols.

c. Tracking patients' outcomes

Physicians and their patients (either through their EMRs or PHRs, respectively) may track and evaluate their outcomes longitudinally over time in response to various treatment regimens. This may help both physicians and their patients to independently and jointly manage care and track treatment results more effectively. However, this feature may be used as a shield by physicians, or as a sword by plaintiffs' attorneys and their medical experts, to the extent that such outcomes tracking is discoverable in litigation—see the following section, "Pitfalls."

POTENTIAL PITFALLS

- ***Potential discovery of tracking of physician performance.*** This could pose a pitfall for physicians using EMRs with this functionality. Some leading ambulatory EMRs may track and compile statistically robust analyses concerning the percentage adherence of their physician users with various best practices suggested by the EMR software for particular types of patients. However, the downside of this would be if this were discoverable by plaintiffs' attorneys. They and their experts could seek to demonstrate the relative non-adherence of a defendant physician user of this EMR software with the types of best practices which (arguably had they been followed) could have prevented a patient's injury. ***To address this pitfall, physician users must first be aware that this capability exists and that their EMRs may be using it. Next, physicians must ensure that whenever they don't follow best practice guidelines or disease/health management protocols, they document why they are not adhering.*** Such justified non-adherence then should not be held against physicians in compiling their performance profiles.
- ***Potential discovery of patient's outcomes.*** Patients' clinical outcomes may be tracked over time (through a longitudinal Continuity of Care or CCR capability). Physicians (or other clinicians in their office) should periodically review these patients' electronic records. In doing so, they should ensure that these records do not reveal worrisome trends in patient outcomes, (as measured by lab results, progressive x-ray changes and other parameters in response to treatment, or lack of treatment) that could provide evidence of neglect to potential plaintiffs' attorneys and/or their medical experts.

NOTE: The simplest response to address these potential pitfalls, it may seem to physicians, is not to install these outcomes tracking and management features at all, including to disable those that might otherwise be in effect. However, given how transparent the practice of medicine has become to payers, patients and policymakers, physicians should carefully consider this option. Physicians' performance will continue to be measured and reported and their compensation increasingly based on how well they do. This feature provides them with some (mostly) private insight to give them time to adjust their practices prior to being evaluated by others.

III. EMR Implementation Considerations

We reiterate that this guide is not intended to serve as a “how to” implementation manual. The implementation process, including speed, scope of features, template design, interoperability, and use must be decided upon by the physician or practice. These decisions should be based on the ability of the practice to dedicate resources, absorb potential practice disruptions, and ensure office commitment. We discuss specific issues here that should be considered in determining the process, as there are EMR implementation considerations that can negatively affect patient safety and/or risk management. While we are not advising you how to implement for your specific practice, we will offer one piece of implementation advice that can address a number of the potential pitfalls already discussed; it would follow the advice offered at “All You Can Eat” diners:

“Take all you want, but eat all you take.”

As we have discussed, not consistently using or ignoring features that provide you with critical information, which could have been used to prevent an adverse event, reduces defensibility in a legal action.

A. “To Do or Not To Do?” - That Really is the Question

EMRs must be implemented in the context of an otherwise well-organized medical office to ensure that the EMR doesn’t merely facilitate errors at the speed of light or create an indefensible position when an unfortunate adverse event occurs. While EMRs offer a variety of tools that can reduce risk and enhance patient safety, they cannot by themselves infuse effective organization and good risk management practices into a medical office which did not already have these. Electronically memorializing poor medical record keeping processes will neither improve the quality of physicians’ medical practice nor enhance their ability to respond to a malpractice claim.

EMRs will dramatically alter how your office operates, how you interact with others in the office, and how patients perceive all of this (which is so important to good risk management). As with any new process, commitment of all staff to the adoption of EMRs and functionality is critical. The decision to adopt EMRs should not be taken lightly.

Furthermore, in addition to the above considerations for implementation, efforts to ensure the confidentiality and security of patient data and the backing up of that data, including adequate storage, system redundancies, and fail-safe mechanisms in case of natural or man-made disasters, need to be considered. A detailed discussion of these considerations is beyond the scope of this guide. However, suffice it to say here that any CCHIT-certified ambulatory EMR product must have provided for all these safeguards. All EMR products to be certified must have demonstrated the HIPAA compliance of their functionalities and overall system as patient data is moved from handwritten to electronic form. All data back-up and storage functions must be in place for any ambulatory EMR product to be certified.

B. Clinical Process Workflow Disruptions and Distractions

Introducing EMRs into an office based practice, much more than a technologic undertaking, constitutes a change management process. “EHR implementation is like moving day for a homeowner, except that you’re moving data from paper to computers and the process lasts for months instead of days” (Lowes, R. “Keys to a Successful EHR Rollout,” *Medical Economics*: July 4, 2008; Duluth, MN).

Depending on the attitudes of its physicians and staff, implementation of an EMR can be a manageable (albeit significant) change management project, or one which can disrupt process workflow for months or longer. In any EMR implementation, the biggest danger is not a hard-drive crash, but a motivation crash among physicians and employees. The confusion and process disruption of a less-than-successful implementation can lead to diagnosis and treatment failures by exacerbating the pitfalls mentioned in this guide.

There are some EMR systems which use the speed of their implementations as a major selling point. Despite some of the benefits of a fast implementation, much more can be lost unless you are entirely committed to a rapid or complete conversion and have carefully planned for the resultant disruption. Even if everybody in the practice is technologically savvy and on-board with the EMR implementation, speed should not exceed thoroughness. Potential patient disruptions can include:

- Lost information
- Patient dissatisfaction with wait times due to physician/staff EMR unfamiliarity
- Patient dissatisfaction caused by reduced personal interaction through too much focus on the computer screen or poor design causing the physician to turn his/her back to the patient for extended periods of time
- Missed alerts
- Difficulty in accessing information during the transition
- EMR system disruptions

Other than ensuring thorough and frequent training (see below), certain implementation techniques or practices can be adopted for the early part of the process to facilitate the transition and thus reduce risk, including:

- It is perfectly justifiable to put into electronic format first the records of those patients who most frequently visit the office, so long as the rationale for taking this approach is spelled out somewhere. There could always be a situation where a patient could suffer an adverse event which may have been prevented had that patient's chart been electronic at the time of the event. However, if this patient visited the office less frequently, it would be defensible not to have made his chart electronic earlier so long as the justifiable rationale for this was documented in advance.
- Scheduling only 50 to 70% of normal patient load (depending on how much you implement at once and your patient population) to provide a time cushion to become comfortable with the technology and still manage patient care optimally.
- Installing functionality on-pace with user ability. Add functionality as comfort levels allow (especially in the case of alerts, guidelines, consultation requests, etc.).
- Following up on transmitted information communicated to ensure understanding by the receiving party.
- During the early stages, having someone other than the physician serve as an "electronic scribe" during the patient visit to avoid disruption of face-to-face communication and eye contact - so essential to the overall patient relationship.
- Alternatively, or in conjunction with the above, having someone queue up all the information for each physician's patient (including graphic displays of the patient's progress over the past few visits) to allow the physician to quickly determine what to ask and how to manage most effectively each patient.
- Informing patients of the transition to EMR and apologizing up-front for any delays or any appearance of depersonalizing visits.
- Explaining the security of the information to ensure they communicate freely.

C. Aligned Goals

Ensure that goals for the implementation are clearly laid out at the beginning of the process and that all staff are aware of, and buy-in to those goals. This should include an understanding of the features and timeline for implementation. Most importantly ensure that:

- Every physician in the practice supports the EMR implementation and understands the changes that will inevitably occur in clinical process workflow.
- Every physician in the practice coordinates his/her customization of templates and other electronic forms (preferably to avoid multiple versions altogether, or, at least to be aware of those that might exist in the practice). This will reduce inconsistencies that impact negatively on patient care when records are shared and patients are treated by multiple physicians.

D. Training and Support

Thorough knowledge of the EMR and its functionality will prevent the misuse or failed use of specific features, and assist in ensuring that the practice staff are moving along the learning curve at the same speed. Provide, or ensure the vendor provides, adequate training to both physicians and staff members concerning the appropriate ways to use EMRs, enter data, and use (or modify or not use) various safety features. The EMR's benefits can be significantly reduced by the inabilities of the weakest link (user). For most, training is not a one-time event. On-going vendor support until thoroughly familiar with all features and functionality is equally important.

As part of the training, be sure to include those items that mitigate the pitfalls previously mentioned:

- How to appropriately close out tasks to ensure task completion
- Where and how free text can be used
- How to create consultative and test requests to ensure understanding by the recipient
- How to scan in outside documents and provide appropriate authentication and attribution
- Understanding defaults and how they populate
- How to ensure consistency between checkboxes and free text
- How alterations and addenda are recorded
- What should and should not be imported into the record
- How printed materials are displayed
- Testing the consultation, laboratory, x-ray and other tracking functions to ensure they are optimized in managing patients and closing loops and gaps in care
- Awareness of the interoperable functionalities of the EMR
- How alerts have been established and for what they will be triggered
- Understanding any differential diagnosis tools and how to respond to recommendations
- Understanding all the metadata (data about data) which various functions can generate (and determining what they would reveal if discovered in a legal proceeding)

E. Customization

Perhaps the greatest value an EMR can offer during implementation is customization. Customized features facilitate acceptance and use by office physicians and staff, and as we have discussed under the section titled, “Checklists/templates and auto-population of data,” can produce information in a format that enhances interpretability and clinical decision-making. The degree to which you may choose to customize features will be a function of the EMR you choose, your technical savvy, and your goals for implementing EMRs.

Where appropriate, customize at the practice level to ensure consistency of records that will enhance communication among staff and covering physicians. As mentioned previously, alerts can be set at customized thresholds to avoid alert fatigue and practice disruption. Some long-time users of EMRs with these features have initially set the threshold for these alerts quite low. Then, over time, they have progressively raised the triggering thresholds once they felt comfortable.

F. Contingency Plan and Backup

As part of the implementation process, consideration should be given to the possibility that the EMR may be unavailable at times. Unavailability may be due to power outages, system crashes, connectivity to remote sites, property loss, etc. Regardless of the cause, a plan for continuing patient care should exist, perhaps including reverting to paper-based records that can be scanned into the EMR upon recovery. Ensure that all staff are aware of the contingency plan to minimize disruption and prevent loss of patient information. Following restoration of the EMR, make sure that alerts that may have been triggered during the unavailable period are not lost. As with any technology, you should backup files (off-site), or ensure that your vendor does so, on a frequent and regular basis to guard against permanent loss.

POTENTIAL PITFALLS
<ul style="list-style-type: none">• Focusing too much on the computer screen at the expense of the patient. This can have the effect of worsening patient relations by diminishing rapport with patients, which can cause patients to bring legal actions following an adverse event when perhaps they normally would not have.
<ul style="list-style-type: none">• Unfamiliarity with EMR causing lack of focus on patient’s symptoms or findings. When not fully familiar with EMR because of poor training or newness, care must be taken to ensure that enough time is spent with each patient to prevent errors.
<ul style="list-style-type: none">• Implementing too much too quickly. Similar to the above, implementing more than you are prepared to handle can result in missed alerts, messages, or other information critical to care of the patient.
<ul style="list-style-type: none">• Varied commitment from partner physicians. The result can be a hodgepodge of electronic and non-electronic records to be discovered in a legal proceeding. This may create an even worse impression regarding the organization of the practice than if it had stayed completely non-electronic.

IV. Summary

This guide is not intended to endorse any particular EMR systems or to even rank the leading systems according to some list of criteria. The screen shots utilized in this guide were selected based upon their ability to demonstrate the particular feature being discussed and should not be interpreted as an endorsement for a particular vendor. Nor is this document intended to be an implementation guide. Rather, the purpose of this guide is only to cover the various safety, quality improvement and risk management features of EMRs and their proper use by physicians and other caregivers.

EMRs offer a litany of features that can improve quality and safety of care which can reduce the risk of adverse events and litigation. Many of the features afford the user with tools that can also mitigate risk when confronted by an adverse event. Furthermore, EMRs can assist physicians and staff employ risk management practices that are often otherwise difficult to implement.

However, EMRs are not without risk themselves. Improperly used, EMRs can create risks that did not exist with paper-based records. With careful thought regarding their implementation and use, these risks may be significantly reduced. The “Pitfalls” sections throughout this document demonstrate how even the best intended use can result in less than optimal care, or increased liability, when certain features are not used effectively.

EMR implementation should be well thought out to ensure that all EMR features implemented are used effectively and in a consistent manner. Using all available features is not as important as is consistently using those that you choose. Having a well thought-out and documented implementation plan, particularly when not applying the EMR to all patients or using full functionality, is equally important. Thoroughness, consistency, and comfort are all more important than speed of implementation.

From the standpoint of improving communications, documentation, office-based practices, and use of clinical systems, all of which may impact clinical judgments and outcomes, EMRs offer a great opportunity. Implemented and used consistently, they may have a tremendously positive impact on the efficiency of office practice and the quality and safety of care delivered to patients.