Reducing Medical Errors with an Electronic Medical Records System

A recent report by the Institute of Medicine estimated that as many as 98,000 people die in any given year from medical errors in hospitals alone. That constitutes more fatalities than from motor vehicle accidents, breast cancer, or AIDS. Add the financial cost to the human tragedy, and medical errors easily rises to the top ranks of urgent, widespread public problems. The report noted that almost all the available information on safety relates to hospitals, and that we know far too little about other areas of care, like nursing homes, home health care, and office based care. It would be expected that hazards in these areas are also common.

On February 22, 2000, President Clinton called for mandatory reporting of preventable medical errors that cause death or serious injury, and voluntary reporting of so-called “near misses” or “close calls”. Studies are underway to develop performance standards and expectations for health care organizations and health professionals.

Experts believe that it is possible to achieve at least a 50 percent reduction in errors over the next five years. The knowledge and technology now exists to prevent many mistakes.

Errors are seldom caused by carelessness or lack of effort. 95% to 98% of errors in medical care are “systems errors”, meaning that they are characteristics of equipment, procedures, job designs, or communication systems used in healthcare. Medication errors alone make up a large percentage of common avoidable problems. Errors can be prevented by designing systems that make error-prone procedures difficult to accomplish and proper methods easy to achieve. Reviewing why certain mistakes happen allows us to look at ways to prevent them. This requires the development of effective systems at the level of direct patient care. Electronic medical records (EMR) is one of these “systems”; it provides a number of tools, reminders, and system checks that can help providers reduce errors.

At Physician Micro Systems, Inc., we have been successfully building and installing electronic medical records systems (sold under the brand name Practice Partner) for ambulatory medical practices for almost 20 years. This forum will focus on several different ways that an EMR helps practitioners avoid errors and improve overall quality of care.

MEDICATION MANAGEMENT

Medications pose one of the biggest medical threats to patients if wrongly prescribed. Improper dosage, adverse reactions, or illegible scripts can all lead to serious complications for the patient. Because of this, ensuring accurate prescriptions is a necessity in improving patient care and reducing medical errors. An EMR should include a complete prescription writing and medication component to help minimize these avoidable errors. The following are a few examples of different medication errors that can occur and how an EMR can prevent them (the following capabilities are based on the Practice Partner Patient Records EMR).

Prescribing Errors

Insufficient knowledge of patient's medical history. Even for established patients, these errors can occur when a record is missing or physicians are prescribing from home. This can be avoided by always having access to a comprehensive medical record whether at home or in the office. An EMR helps ensure that the medical record, including the prescription section, is up-to-date and easily accessible (even from home via dial-up access). The universal access of patient information provided by the EMR to all members of the clinical team helps minimize errors based on incomplete information. Ideally, progress note information should update the rest of the chart (i.e. problem lists, allergies, medications) to ensure that that the information in the patient's chart is comprehensive and up-to-date. Patients can also be easily given a one page medical record summary to keep in their wallet (via a simple printout from the EMR) that includes major medical problems, current medications, allergies, and the last set of vital signs. This allows other physicians who might be seeing the patient to have a more accurate picture of their medical history.

Ignorance of the prescribing drug or its interaction with other drugs. An EMR's prescription writing module incorporates information on the available strengths of the drug being prescribed, as well as alternative medications in its class. Drug-to-drug interactions are automatically checked, as well as drug-allergy interactions. Even over the counter drugs and herbal preparations can be checked for adverse interactions.

Errors in writing the name of the drug or dose. Medication templates provided with an EMR include the latest drug information, and automatically insert the correct spelling, correct dose, and frequency information into the prescription. In addition to the standard templates, providers can create their own templates for medications they frequently prescribe. By templating medication information, providers are less prone to potential errors as they prescribe.

Dispensing Errors

Failure to confirm correctness of the prescription. Wrong interpretation of the doctor's prescription: Most EMR's work by creating a printed prescription, which is then signed and handed to the patient, eliminating the need for the pharmacist to interpret a physician's handwriting. Prescriptions can also be faxed to the pharmacy directly from the EMR, eliminating any chance for damage to the paper that may render it less legible (or the opportunity to be tampered with).

Inaccurate calculation of dosage, especially in children. Nomograms can be created using the EMR to accurately calculate doses and print them on the prescription.

Drug Administration Errors

Drug given to the wrong patient. The patient's name, address, and allergies are printed on the prescription so that there is less chance that a similar appearing name will be placed on the bottle and given to the wrong patient at the pharmacy. A printed prescription list of all the medications a patient is taking can be easily printed from the EMR to help the patient avoid taking an incorrect medication.

Wrong dose or strength given. The use of templates minimizes the chances that an incorrect dose will be prescribed by the physician and printed instructions reduce the likelihood that the patient will take the medication incorrectly.

Wrong route of administration. An EMR will report if there is no drug available with that name and route of administration if an incorrect route is written on the prescription.

Wrong time or frequency of administration. Templates and clearly printed doses help prevent these errors. In addition, patient education materials can be printed out so that the patient has the necessary information to take the medicine appropriately.

Recalled Medications

When a medication is recalled, a simple EMR query can be run over the entire patient population, which creates a list of patients taking the medication. A mail merge file can be created from this report so that letters are immediately sent to patients notifying them of the recall. This entire process can be completed in a matter of minutes.

DISEASE MANAGEMENT

Because an EMR provides the ability to assemble data in a clinically relevant way, it allows a physician to easily follow medical markers over time. This feature is particularly relevant for disease management. For example, glycohemoglobins can be graphed so that an upward trend is noted and appropriate intervention can be taken before the blood sugars are out of the normal range. This graphical trending can also be used to note slow but steady increases in blood pressure, creatinine, weight, or other variables. Flow charts can graph disparate chart elements such as a medication, vital sign, and lab and how they are related over time.

An EMR also provides reminder tools to help insure that certain tasks are completed. As an example, abnormal pap smears or other test results must be followed up with repeat testing or special studies. Using the EMR, a provider can send a future reminder to himself or another staff member who is activated at the relevant date. This reminder system can also be used for routine activities. For instance, many practices have found patient satisfaction and medication compliance improve when they call patients 1-2 weeks after starting a new medication.

An EMR can also function as a repository of practice guidelines and other reference materials that may be relevant to patients. These guidelines are typically embedded within a disease-specific template that is used to help create the progress note. The template will also prompt the clinician to ask questions specific to the condition. These factors improve quality of care and documentation.

LABORATORY RESULTS MANAGEMENT

Managing lab results is one of the most important and critical tasks of an ambulatory practice. An EMR, through the use of an electronic interface with the clinical reference lab, can make this process much easier and less prone to error. Via the interface, results are downloaded into the patients' chart automatically and await a signature in an "electronic" review bin within the EMR. This decreases the likelihood that the physician will miss labs. Additionally, abnormal values are highlighted in red (for high) or green (for low). Critical results generate an urgent e-mail message to the physician. Results are easily viewed chronologically and can be graphed to display trends.

ERRORS OF OMISSION

An EMR can also provide age and sex specific reminders for overdue health maintenance items. Depending on the software configuration, this can be flagged when making the appointment with the patient (red flags will appear if the patient has overdue health maintenance items), alerting the staff of the need to have the patient schedule a particular procedure or test. Similar flags in the patient chart alert the physician to needed preventive care as the patient is being seen. This can reduce the incidence of missed diagnoses for diseases that should regularly be screened for. Internal Quality Assurance programs can track the practice's compliance with HEDIS guidelines and other measures of optimal patient care.

DOCUMENTATION AND PATIENT COMMUNICATION

In addition to the benefit of completely legible notes, there are other documentation benefits to an EMR. The software will document a progress note for all no-shows or cancellations and these notes are automatically placed in the physician's review bin so that they can be signed off or acted upon as needed. Patients who need regular follow up can be placed in a recall file where letters are generated when they are due for appointments. All telephone messages can be sent through the internal e-mail system and documented in the patient chart.

Messages can be flagged by the degree of importance with the highest level creating a red flag on the recipient's computer. This assures that urgent messages are seen in a timely fashion even when a physician is in an exam room.

SUMMARY

Many of the medical errors that occur in the outpatient setting can be prevented by the use of an electronic medical record. The EMR can also reduce costs and improve efficiency while improving care. For more detailed information on Electronic Medical Records we encourage you to refer to our other resources, including *EMR 101: A Beginner's Guide to Electronic Medical Records* and *The Dollars and Sense of Electronic Medical Records: The bottom line case for an EMR.* These forums, along with a variety of other educational materials, can be found on our web site at www.microwize.com/practicepartner, or by contacting us directly.

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