AMCP Academy of Managed Care Pharmacy

Concept Series Paper on Electronic Prescribing

E-prescribing is the use of health care technology to improve prescription accuracy, increase patient safety, and reduce costs as well as enable secure, real-time, bi-directional, electronic connectivity between clinicians and pharmacies. This is achieved by providing prescribers with a secure means of electronically accessing health plan formulary, patient eligibility, and medication history at the point of care and securely transmitting the prescription electronically into the pharmacy's computer system. The purpose of this paper is to review the key features in many e-prescribing applications as well as some of the benefits and challenges.

There are many drivers contributing to the increased use of e-prescribing applications. Improved patient safety is probably the most important, because e-prescribing generates legible prescriptions that have been checked at the time of prescribing against the patient's electronic medication profile for possible harmful interactions. Medication errors and adverse drug events contribute to approximately 7,000 deaths a year, with an estimated cost for drug-related morbidity and mortality exceeding $77 billion a year.[i] A minimum of 1.5 million preventable medication errors occur each year in hospitals, nursing homes and ambulatory care settings, according to the Institute of Medicine (IOM). IOM has recognized e-prescribing as one of the most promising tools to reduce such errors and recommends that all prescriptions be written electronically by 2010.[ii] The Massachusetts eRx Collaborative has documented this increase in safety: 2 percent of electronic prescriptions written in June 2006, more than 8,000 prescriptions, were changed by prescribers as a result of drug-drug or drug-allergy interaction notifications provided to prescribers through an e-prescribing system.[iii]

Data released in October 2007 by the Southeast Michigan ePrescribing Initiative (SEMI), a broad coalition involving General Motors, Ford Motor Company, Chrysler LLC, the United Auto Workers (UAW), Blue Cross Blue Shield of Michigan, Health Alliance Plan, Henry Ford Medical Group, Medco Health Solutions, Inc. and CVS Caremark Corporation, also demonstrated that e-prescribing significantly reduced medication errors. The analysis is the first to look at the overall results of the SEMI program, which has generated nearly 6.2 million prescriptions using e-prescribing technology since its launch in February 2005. In October 2007, the program had nearly 2,500 physician participants electronically prescribing more than 282,000 prescriptions each month. Their findings demonstrated that e-prescribing substantially improved patient safety by alerting physicians of risks related to drug interactions and other potential medication problems. This resulted in a significant number of prescription changes, which prevented possible adverse events. Among a sample of 3.3 million prescriptions reviewed, a severe or moderate drug-to-drug alert was sent to physicians for more than 1 million prescriptions (33 percent), resulting in nearly 423,000 (41 percent) of those prescriptions being changed or canceled by the prescribing doctor. More than 100,000 medication allergy alerts were presented, of which more than 41,000 (41 percent) were acted upon.[iv]

Another driver contributing to the increased use of e-prescribing is that the population in general, including prescribers and physician office staff, has become more familiar with computer technology. Computers, PDAs, digital notepads and other computer-type devices are now commonplace. More

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physician offices use computerized office management systems and electronic medical records. The net cost of e-prescribing applications, computers and connecting to the internet or intranet through vendors and wireless networks have all decreased in price, making them more accessible. Lastly, all the key constituencies, prescribers, patients, pharmacies, health plans and prescription benefit management companies (PBMs) see the advantage in the promise of e-prescribing.

The Medicare Prescription Drug, Modernization and Improvement Act of 2003 (MMA) requires that Medicare Part D plans must support e-prescribing by 2009. The MMA provides for the development of e-prescribing standards. All prescription drug plans participating in Medicare must have the capability to handle e-prescribing by 2009. The adoption of e-prescribing by prescribers and pharmacies is voluntary. Prescribers are not required to prescribe electronically, but if they do, they must use information technology that conforms to standards established by the Centers for Medicare & Medicaid Services (CMS).

Benefits to prescribers

When e-prescribing is fully implemented in the office environment, prescribers find that efficiency increases. When the prescriber enters the prescription into the e-prescribing application, the prescription is transmitted to the pharmacy and may be entered into the patient's medical record and integrated with the office billing system if these systems are linked electronically. Automated steps free up the prescriber and office staff from routine tasks and allow the staff to perform other functions. Such efficiencies translate into lower overall operating costs.

E-prescribing improves the accuracy of the prescribing function. The legibility issues related to a handwritten prescription are resolved. Of equal or greater importance, the data entry format, where the prescriber must choose the drug name, quantity and directions from an established list of choices, improves the standardization of the prescription writing process. Many e-prescribing applications will auto-populate the prescriber's commonly used medications with quantities and directions. This standardization streamlines the process and reduces the number of errors. The American Medical Association (AMA) has acknowledged the benefits of e-prescribing functionalities, including the ability to review patient medication histories, formulary information and safety alerts, in order to help reduce the risk of adverse drug events and out-of-pocket costs for patients.[v] In the SEMI initiative, nearly 56,000 lists of dispensed prescription histories were downloaded by physicians.[vi]

Many e-prescribing tools are able to connect to the patient's health plan or PBM information and provide feedback as to whether a specific medication is included on the organization's formulary, and if not, provide a list of formulary alternatives. This additional information available to the prescriber reduces the number of questions that patients or pharmacists dispensing a prescription ask regarding formulary issues. The prescriber is able to obtain that information as the prescription is being written.

E-prescribing applications have the potential to check drug information databases for appropriate prescribing guidelines, the patient's complete medication profile for drug interactions, and the patient's electronic medical record for disease contraindications. This resource allows the prescriber to review the chart while the patient is still in the office and to request additional information from the patient if necessary. E-prescribing enables prescribers to take advantage of larger medication history databases through electronic prescription data communication link organizations. Such organizations electronically route patient medication history and pharmacy benefit information to physicians in their offices and at hospitals in order to improve patient safety. [vii] This feature saves the prescriber valuable time and effort and further reduces the number of errors or adverse events.[viii]

E-prescribing applications streamline communications between pharmacies and prescribers. The e-prescribing tool can automatically send the prescription to the pharmacy via a fax server or through secure electronic transmission of prescriptions. In addition, pharmacies have the capability to request refills electronically or to pose routine prescriber questions via the e-prescribing system rather than through a phone call to the prescriber. This process is more efficient because refill requests can be queued up and reviewed at the prescriber's convenience. The prescriber will be able to review those requests anywhere using a hand-held device (PDA) or a remote computer. The end result is increased efficiency and fewer pharmacy calls to the prescriber.

Benefits to patients

The benefit most evident to patients is increased convenience. Prescription orders sent via fax or electronically to pharmacies make it possible for patients to arrive at the pharmacy and have their prescription orders waiting for them. If a prescription order is sent to a mail order pharmacy, the patient does not have to mail it and may receive the prescription in the mail several days earlier. Refill orders will also be streamlined and processed faster.

As explained above, the ability to cross-check a new prescription order at the point of prescribing for drug interactions and the patient's medical conditions will result in a reduced incidence of adverse events. Warning checks for allergies and duplication of current medications can be communicated to the prescriber. There is the capability to cross-check the patient's prescriptions with their current insurance coverage and across other insurance coverage where the patient may be eligible for benefits.

Lastly, patients may be able to reduce their copayment expenses, because prescribers will have the patient's health plan or prescription benefit management company (PBM) formulary information available at the point of prescribing. This will make it easier for the prescriber to consider alternatives and to discuss options directly with the patient while the patient is at the prescriber's office rather than while the patient is waiting at the pharmacy. The SEMI initiative found that when a formulary alert was presented, 39 percent of the time the physician changed the prescription to comply with formulary requirements.[ix]

Benefits to pharmacies

E-prescribing has the potential to significantly improve pharmacy dispensing operations. Prescriptions that are electronically transmitted are more legible and can improve work flow. Systems exist for electronic prescriptions to automatically flow into the pharmacy's prescription filling software and prepare the label and paperwork ready for the pharmacist review. More effective handling of refill authorization and routine issues via electronic means will also improve the efficiency of pharmacy operations. Lastly, many of the issues currently resolved at the pharmacy level, such as benefit design, formulary alternatives, utilization management requirements, and quantity limits, will be addressed at the time the prescriber transmits the prescription, and a clean prescription will be received at the pharmacy.

Benefits to pharmacy benefit management companies (PBMs) and health plans

E-prescribing brings many benefits to PBMs and health plans. Studies have demonstrated that drug costs may decrease and plan performance may improve as a result of better formulary adherence, better drug utilization review, and fewer errors when the prescription claim is adjudicated.[x] PBMs benefit

from simplification of the administrative process when the drug formulary is considered at the point of prescribing, because fewer prior authorizations are generated. In the future, there may be opportunities for improving drug utilization if PBMs or health plans are able to provide feedback at the point of prescribing, such as a patient's prior claim history from other prescribers. Savings from administrative simplifications and improved drug utilization can be passed on to payors, such as employers, that utilize PBMs and health plans to administer their pharmacy benefit. E-prescribing software also provides an opportunity for PBMs and health plans to implement clinical decision support tools, or electronic guidance, which encourages providers to follow recognized prescribing guidelines.

Challenges for e-prescribing

The e-prescribing industry is rapidly changing. The number of prescribers using e-prescribing tools is growing rapidly. Some of the challenges are briefly discussed below:

- Usability/complexity: Some prescriber's offices do not make extensive use of computer technology. For those prescribers, introducing an e-prescribing application is a major hurdle. However, the trend is for most office personnel, as well as prescribers, to become more familiar with this technology.
- Financial consideration: Determination must be made as to who has the financial responsibility to pay for an e-prescribing system.
- Incorporation into workflow: This is a major factor in determining e-prescribing application success. If the e-prescribing tool is integrated with the office management, scheduling system, billing systems, and electronic medical records, then there is a greater potential for success.
- Prescriptions for controlled substances: As of April 2008, federal regulations prohibiting controlled substances from being electronically prescribed continue to be an impediment to the widespread adoption of e-prescribing.
- National standards: In order for all prescribers to communicate electronically with many different entities, pharmacies, PBMs, and health plans, it makes sense to standardize the data and information that is transmitted to each entity. The National Council for Prescription Drug Programs (NCPDP) has a long history of working with the pharmacy industry to build consensus for electronic claim transactions. NCPDP is doing the same with e-prescribing. NCPDP has been successful in developing a prescription order electronic standard (SCRIPT standard) and is working on developing other standards to support e-prescribing (e.g. SIG standard).
- Security and privacy concerns: E-prescribing vendors have successfully addressed the concern regarding the transmission of electronic records from prescriber to pharmacy or between other entities. The current standard is to use 128-bit encryption and has been found to be effective in protecting electronic prescriptions or medical records. However, the U.S. Drug Enforcement Administration has not permitted the use of e-prescribing for controlled substances.
- Opportunity for new types of prescribing errors: Published studies conducted in hospitals using computerized prescription order entry (CPOE) have identified examples of computer-entry errors. One study found that a widely-used CPOE system facilitated 22 types of medication error risks. Examples include fragmented displays that prevent a coherent view of patients' medications, pharmacy inventory displays mistaken for dosage guidelines, and inflexible ordering formats generating wrong orders.[xi] As e-prescribing systems are implemented, health care professionals must monitor for errors that these systems may cause in addition to the errors that they prevent.

Conclusion

For many, the definition of e-prescribing is much more than the simple description provided at the beginning of this document. E-prescribing has evolved from a data entry tool with a fax capability to a robust application with network connectivity to many entities besides pharmacies, and with strong error checking facilities. Vendors continue to improve their applications and to add more features.

Managed health care systems will in time integrate the electronic prescription record by linking it to other medical record systems. Although e-prescribing has many benefits, these systems have been slow to gain use nationally as a result of the capability, cost, training, and integration issues described above. However, the benefits of e-prescribing are becoming more apparent to all stakeholders.

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[ii] "Preventing Medication Errors," Institute of Medicine, July 2006.

[iii] eRx Collaborative Press release, eRx Collaborative Boosts Patient Safety with 8,000 Prescriptions Changed in June, September 5, 2006, available at http://www.erxcollaborative.org/Press%20Release%20September%202006.pdf. (Accessed January 4, 2008).

[iv] PR Newswire, "Southeastern Michigan ePrescribing Initiative Reports Substantial Reduction in Medication Error Risks," October 29, 2007, available at: http://www.smartbrief.com/news/aaaa/industryPR-detail.jsp?id=DF023486-C27C-4DE6-8077-440E38BA6A4D. (Accessed March 28, 2008).

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[vi] PR Newswire, "Southeastern Michigan ePrescribing Initiative Reports Substantial Reduction in Medication Error Risks."

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[viii] California HealthCare Foundation. *E-Prescribing*. Prepared by Petter Kilbridge, M.D., November 2001, available at http://www.chcf.org/documents/hospitals/EPrescribing.pdf. (Accessed January 28, 2008), p. 6.

[ix] PR Newswire, "Southeastern Michigan ePrescribing Initiative Reports Substantial Reduction in Medication Error Risks."

[x] Electronic prescribers' pharmacy costs decreased 3-3.5% due to increased use of preferred formulary brands and generics, in highly managed market. (eRx Collaborative Press release, eRx Collaborative Boosts Patient Safety with 8,000 Prescriptions Changed in June, September 5, 2006) and generics increased 4.8% vs. control. (Morrow C, Coleman M. The Role of eRx in Lowering Physician Drug Expenses. White paper published by Southwest Medical Associated, 2006) from Gorman Health Group/Pharmaceutical Care Management Association, *Options to Increase E-Prescribing in Medicare: Reducing Medication Errors and Generating Up to $29 Billion in Savings For the Federal Government*, July 2007. Available at http://www.pcmanet.org/assets/pdf/GHG-PCMA%20Options%20to%20Increase%20E-prescribing%20in%20Medicare%20July%2007%20FINAL.pdf (Accessed January 4, 2008).

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