Review Article

Updating health care quality with digital prescriptions and health records- A review

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ABSTRACT:
E-Rx also called as Electronic prescribing (e-prescribing) is a digital version of a prescription created by healthcare practitioners (HCPs) using digital software. Also, it helps create digital health records of patients which improves the chances of better patient outcomes by reducing the human error to interpreting wrong medicines. It is an important part of the nation's push to enhance the safety and quality of the prescribing process. The results of this Review study suggest that e-prescribing reduces prescribing errors, increases efficiency, and helps to save on healthcare costs. However, there have been significant barriers to implementation including cost, lack of provider support, patient privacy, system errors, and legal issues.
Key words: electronic prescribing, cost, benefits, barriers to implementation, safety

INTRODUCTION
E-Rx also called as Electronic prescribing (e-prescribing) has been defined as the computer-based electronic generation, transmission, and filling of a prescription, taking the place of paper and faxed prescriptions. Most prescribing occurs in the outpatient care setting, where paper-based prescribing is most heavily used, so this type of community-based setting holds the greatest potential for e-prescribing to be achieved. E-prescribing has allowed prescribers to electronically send patients' prescription information to pharmacy computers. This process has decreased prescribing and medication errors and has resulted in fewer call-backs from pharmacies to physicians for clarification. Electronically sending and receiving prescriptions has streamlined the clinical practice workflow, and patient satisfaction and compliance have increased. Additionally, connecting physician and pharmacy systems has reduced paperwork and the associated mistakes that may occur from reliance on handwritten notes. This change has produced time and cost savings for all parties involved. Even with all the benefits of e-prescribing, many providers and pharmacists have remained hesitant about completely adopting an e-prescribing system. [1-5] The main purpose of this review was to explore the benefits that e-prescribing has had in improving the efficacy, accuracy, and cost of prescribing in ambulatory care settings and to assess the barriers to its implementation.

BENEFITS AND ADVANTAGES OF E-PRESCRIBING IMPLEMENTATION
1. Patient Safety and Use of E-prescribing
Patient safety can be improved through e-prescribing by increasing prescription legibility, decreasing the time required to prescribe medications and dispense them to patients, and decreasing medication errors and Adverse Drug Event (ADEs). The National ePrescribing Patient Safety Initiative started to provide physicians with a free e-prescribing web-

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based tool called eRx to encourage them to learn how to write prescriptions electronically in order to reduce preventable medication errors.[6-10] When e-prescribing is part of an EHR system, prescriptions can be checked for interactions with patient medications, health conditions, and allergies. Research found that error rates decreased from 42.5 per 100 prescriptions to 6.6 per 100 prescriptions.[1-5]

2. Efficiency of E-prescribing
E-prescribing improves the efficiency of the prescribing process. Though the actual entering of a new prescription takes about 20 seconds longer per patient than writing a prescription, this time is offset by the time saved because of the fact that less clarification is needed for electronic prescriptions. Prescribers spent more time on the computer, on average an extra 6 minutes per prescriber per day or an increase of 20 seconds per patient when seeing 20 patients per day. If implemented correctly, e-prescribing should cause little disruption in the workflow of ambulatory care settings. At the pharmacy, the entering of prescriptions is more streamlined when software allows for automated processing. An increase in efficiency is seen after implementing e-prescribing, mainly due to less paperwork and fewer issues needing to be resolved. Patient and prescriber names are matched up automatically by the system, while other fields are generally automatically populated but often require manual manipulation; the main fields are drug name, quantity, and patient instructions. Providers have found that less time is spent resolving issues with pharmacies, including prior authorizations and refill requests. By having patients' prescription formularies and eligibility information available, prescribers can pick an appropriate medication and reduce the probability of receiving a call from the pharmacy to change the medication to an alternative. [11-13]

3. Cost Savings Associated with E-prescribing
E-prescribing has the potential to save money. An analysis of a study done between 2008 and 2010 estimated $140 to $240 billion in savings and improved health outcomes, mainly through improved medication adherence, over 10 years. Large savings occur with the reduction of ADEs, mostly due to reduced visits to primary care offices and emergency rooms. [14-19]

4. Increase in Patient Medication Adherence and Patient Cost Savings
Another potential cost savings results from the increase in patient medication adherence. Increased adherence to medication therapy can promote better health outcomes and reduce costs. Research found a 10 percent increase in prescriptions picked up when e-prescribed compared to written prescriptions. Along with medication adherence, substitution of generic medications or less costly formulary alternatives can reduce the cost to patients and insurance companies. E-prescribing systems can help physicians choose a low-cost option that may be clinically better for the patient by eliminating bias. [8,10]

5. Meaningful Use and E-prescribing
Eligible healthcare providers throughout has made e-prescribing one of the core requirements of meaningful use, requiring eligible providers to transmit at least 40 percent of eligible prescriptions electronically. Other meaningful use criteria that relate to e-prescribing include the ability of technology to check for drug-drug and drug-allergy interactions, the ability to maintain a medication list, and the ability to perform drug formulary checks. [11,16]

BARRIERS TO IMPLEMENTATION OF E-PRESCRIBING
1. Cost of Implementing an E-prescribing System
While e-prescribing offers many benefits, not all providers have been excited about implementing e-prescribing systems. A major barrier, reported by more than 80 percent of primary care physicians, has been lack of financial support. New technology requires training and information technology support for installation and upkeep. A practice must take these costs into account when deciding whether to implement an e-prescribing system. Policies and financial rewards are not sufficient incentives for all prescribers to adopt e-prescribing. Providers have faced many barriers with the complex technology and lack of complete patient record availability through e-prescribing systems. [19]

2. E-prescribing System Errors
If an e-prescribing system has not been designed properly, new types of errors can occur. A major error is lack of alert specificity and overload of alerts, producing a phenomenon called alert fatigue: when presented with loads of alerts when each prescription is entered, prescribers tend to stop reading the alerts and just quickly scroll through them. When alerts are ignored, a major interaction can be missed. [3-10]

3. Privacy and Legal Issues
Privacy of patient information can also be a concern for providers and patients. Most EHR systems are web based, and some deliver information wirelessly. Information can be leaked at numerous points, and if proper firewalls and intrusion prevention systems are not in place, the opportunity exists for protected patient information to be stolen. Most information breaches actually occur as a result of internal employees' actions, so continuous training on security is imperative and can incur additional costs. Legal issues arise when providers need to prescribe controlled substances. The current rules have made it

legal to transmit controlled substance prescriptions electronically, though the many standards contained in the ruling make it cumbersome to implement. These standards include identity proofing, two-factor authentication, digital certificates, monthly logs, third-party audits of software, and a requirement to keep two years of records. [10-15]

DISCUSSION

The purpose of this research was to explore the benefits that e-prescribing has had on the efficacy and accuracy of prescribing in clinical settings. E-prescribing also helps to make patient care more efficient. It streamlines the process of getting the prescription to the pharmacy, dispensing the medication, and obtaining refills. Because the patient is not given a hard copy of the prescription, the potential for losing the prescription is eliminated. The instances of pharmacy-initiated clarifications have decreased, reducing the amount of time pharmacists and providers spend on the phone and thus reducing the time taken to fill the prescription and get it to the patient. Increased compliance and monitoring of compliance are also results of implementing e-prescribing. This review could be limited by the search strategy used and the number of databases searched, and publication bias may have restricted the articles that were available for this review. Research on e-prescribing in ambulatory care settings is also limited compared to that in hospital settings. Fewer studies have addressed the benefits of e-prescribing and error reductions in the ambulatory setting as compared to hospital settings.

CONCLUSION

The findings of this review research show that E-Prescribing is a prescriber's ability to electronically send an accurate, error-free and understandable prescription directly to a pharmacy from the point-of-care – and it is an important element in improving the quality of patient care. The inclusion of electronic prescribing is important in e-prescribing in reducing medication errors has received widespread publicity, helping to build awareness of e-prescribing's role in enhancing patient safety. Adopting the standards to facilitate e-prescribing is one of the key action items in the governments plan to expedite the adoption of electronic medical records and build a national electronic health information infrastructure in global health. The study suggest that e-prescribing has the potential to increase patient safety and patient medication adherence; create cost savings for medical clinics, hospitals, and patients; and improve efficiency in the ambulatory care setting. However, barriers to its implementation still persist, the main one being the cost of implementation.

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