INTRODUCTION

The days of the paper prescription will likely come to end. At the end of 2010, approximately one in four prescriptions was delivered electronically by the healthcare community, up from one in 18 prescriptions at the end of 2008; growth, in part, spurred by two key pieces of U.S. government legislation.1 The legislation offers financial incentives to healthcare practices using electronic prescribing tools in electronic health records or standalone products, and it penalizes practices that fail to comply. The advent of the HITECH Act (Health Information Technology for Economic and Clinical Health), part of the American Recovery and Reinvestment Act of 2009 (ARRA),2 and the 2008 Medicare reform bill, MIPAA (Medicare Improvement for Patients and Providers Act),3 fundamentally changes prescription processing by pressuring thousands of healthcare practices into automation.

Legislation alone will not assure a smooth and beneficial transition to electronic prescribing. To investigate remaining impediments to widespread adoption of e-prescribing, the Office of the National Coordinator of Health Information Technology (ONC) held a hearing in January 2010 to elicit testimony from pharmacists, clinicians and health technology experts.

First Databank (FDB), developer of the highly respected FDB MedKnowledge™ (formerly NDDF Plus), was invited to share its views at that hearing.

The Evolving E-Prescribing Landscape

E-prescribing is making inroads into clinical settings as clinicians seek out tools that safeguard patients from medication errors, which cause injury or death to approximately 1.3 million people annually in the U.S.4 In a study by clinicians at Weill Cornell Medical College (WCMC), medication errors decreased seven-fold when doctors used electronic systems to write prescriptions. On the other hand, nearly two in five handwritten prescriptions contained errors, such as incomplete instructions and incorrect dosages.5

While the rate of increase is phenomenal, the actual number of e-prescribers at the end of 2010 (234,000) and e-prescriptions (326 million), representing about 34 percent of all office-based prescribers, is still low.6 But change is ahead as clinicians, faced with a growing number of e-prescribing tools, consider their options in light of the time-sensitive HITECH Act. The Act offers government funding to clinicians who purchase EHRs with e-prescribing capability and delivers penalties for non-compliance.
The Congressional Budget Office estimates that 90 percent of doctors and 70 percent of hospitals will be using EHRs within the decade as a result of the HITECH Act. But satisfying the medical community will take more than building products that qualify for government incentives. While purchasing a government-certified product will give clinicians access to structured drug content that describes medications, potential interactions and adverse effects, drug knowledge can go further in improving prescription management than current requirements dictate. It can be intuitively designed to make e-prescribing safe, easy to use, and effective for all constituents.

The Elements Of Effective E-Prescribing

While the present state of e-prescribing holds the promise of greater patient safety, it does not guarantee that the systems clinicians purchase will fulfill this promise. From our perspective as a drug knowledge provider, we believe the best approach to e-prescribing is one that harnesses drug information to drive clinician efficiency. We’ve identified the following functionalities as key challenges in the design and execution of meaningful e-prescribing solutions that empower clinicians to make safe and appropriate drug choices:

1. Make E-Prescribing Easy for Clinicians to Use

On the back end, an e-prescribing application is a complex system that displays medication information in many ways, such as by class, diseases, benefit formularies, appropriate dosages, and potential drug or allergy interactions. On the front-end, the system should be easy to navigate, support a natural and efficient workflow, and employ clinician-friendly concepts. Drug information should be as concise as possible to keep clicking and scrolling to a minimum. Overly long drug lists and unnecessary individual steps to complete a prescription lead to frustration at best and opportunities for error at worst.

An ideal e-prescribing system presents the clinician with clinically-valid choices in the form of drug pick lists. These lists strike the right balance between length and thoroughness by offering clinically-valid drug choices and prebuilt structured content that account for such patient-specific factors as age, weight, disease classification, and known allergens.

Pick lists can save time, improve the accuracy of patient instructions, and reduce instances of alerting that occur when a clinician prescribes an inappropriate medication or dose.

To keep the steps involved in medication orders to a minimum, an e-prescribing system should only require clinicians to enter information appropriate to their domain.

For example, a clinician who wants to order a drug for a pediatric patient shouldn’t have to specify the strength of the tablet. Instead, the system should calculate the weight-based dose and provide the clinician with practical suggestions for final doses. Dose rounding is a challenge that can be addressed with knowledge that’s specific to the drug and the age of the patient.

2. Lower the Chance of Alert Fatigue

Alerts increase patient safety by warning clinicians of potential problems, such as drug allergies, duplicate therapies, and drug-drug interactions. Because alerts cover the entire gamut of potential problems, including warnings manufacturers may place on labels for liability reasons, the sheer number of warnings can desensitize clinicians to the point where they ignore all alerts—a condition often referred to as “alert fatigue.” In some cases, clinicians may decide to turn off all alerts in an e-prescribing system, which compromises patient safety and clinician decision-making.

Key elements in patient protection are the drug-drug interaction and drug-allergy screenings and related rules outlined for Stage 1 of the HITECH Act. In our experience, it is possible to provide meaningful alerting without message overload by offering users options for fine-tuning alerts to meet individual needs.

The indiscriminate use of pop-up screens for all severity levels of alerts interferes with clinician workflow and disrupts the e-prescribing process. While some warnings warrant pop-ups, others could be displayed in a less intrusive manner, such as in sidebars or information buttons. Balancing the patient safety aspects of alerting, with the needs of clinicians, requires categorizing alerts by more than just severity level alone.

Alerts that contain sub-groupings as well as broad severity levels will provide the necessary flexibility to handle variations in practice. A proven way to manage alerts for drug-drug interactions is to characterize them by the type of documentation underlying the alert. For example, is the interaction proven in controlled studies? Does it exist solely because it appears on a manufacturer’s label?

Look for meaningful ways to differentiate alerts in your implementation, such as treating alerts differently when conflicting evidence exists or when risk is limited to certain kinds of patients. To ease the development process, look for designations that have been prepopulated by a reputable drug content provider whose job it is to comb the literature and build categories that cut down on noise.
Since clinicians will not always agree on alerts, developers will want the flexibility to customize alerts. Look for highly granular content, since it will be able to support the editing of interactions down to a single agent or strength of an ingredient within an interaction pair.

3. Codify as Much Information as Possible
Storing any prescription information as free-form text reduces the effectiveness of e-prescribing and adds steps to the prescribing process. For example, a clinician charged with medication reconciliation typically resorts to manual entry in the process of comparing, changing, and transferring accurate medication orders at patient transfer points.

In the future, when codifying all parts of a prescription becomes standard practice, e-prescribing will deliver greater value by extending the portability of patient medication records and assuring the detection of potential adverse drug events from significant drug interactions or drug allergies. Furthermore, codification assures that electronic prescriptions can contribute to future outcomes by providing rich data for analysis. For example, analysis could reveal that a given medication taken only three times per week is as effective and causes fewer side effects than the same medication taken daily.

4. Improve Communication Between Pharmacists and Clinicians
All day long, calls fly between pharmacies and clinicians in an effort to fill and refill prescription medications accurately. A few years ago, leaders in the prescription field estimated that 30 percent of the 3 billion prescriptions filled in the United States each year required a call from a pharmacist to a clinician. And, a study by the Medical Group Management Association (MGMA) Group Practice Research Network estimated that the time spent managing unnecessary administrative complexity related to prescriptions can be valued at approximately $15,700 a year for each full-time physician. This figure is based on the time associated with manually processing refills, resolving issues related to formulary (which specifies a patient’s drug coverage) as well as issues related to dosage and legibility (this estimate does not take into consideration the time spent managing faxes, which would likely increase, and which may drive these drive these estimates even higher).

E-prescribing promises to eliminate the reasons for many of these calls—from illegible text or missing information on handwritten prescriptions to contraindications based on allergies, drug interactions, or duplicate therapies. At present, most instances of e-prescribing represent one-way communication from the clinician to the pharmacy—a missed opportunity for fully capitalizing on the potential of e-prescribing for safer, faster, and more efficient communication.

The right refinements in e-prescribing systems can limit phone calls still further as the following examples indicate:

1) Ideally, the clinician who purposely overrides an alert should be able to inform the pharmacist of the deliberate decision. This keeps the pharmacist from needing to call the clinician to warn about a potential safety issue.

2) A patient may refuse a medication that’s not covered by their health plan, causing the pharmacist to call the clinician about a substitute. This need for pharmacist calls decreases—and patient compliance with medication orders increases—when e-prescribing tools provide clinicians with easy access to formulary restrictions and high co-pays on patient health plans.

The National Council for Prescription Drug Programs (NCPDP) SCRIPT standard for e-prescribing provides a messaging standard that is indispensible in the exchange of prescribing data. The standard was first published in 1997 and has been updated annually based on the business needs identified by the industry. SCRIPT is a standard created to facilitate the transfer of prescription data between pharmacies, prescribers, intermediaries and payers.

However, communication breakdowns due to differences in implementation, or use of different versions of the standard may limit the effectiveness of e-prescribing.

CONCLUSION
The Promise of E-Prescribing—A World Free of Medication Errors
At its best, e-prescribing empowers clinicians to make safe and appropriate drug choices for their patients and to communicate that information in an efficient and unambiguous manner. It paves the way for meaningful communication between clinicians, pharmacists, and their patients, and increases the odds of patient compliance by simplifying the process of filling a prescription. Beyond promising fewer phone calls between clinicians and pharmacists, e-prescribing can put an end to time-consuming, repetitive, and potentially error-prone transcriptions in pharmacies and healthcare practices.

The future of e-prescribing is full of promise. Standards are still emerging to streamline a multi-directional exchange of medication information, and software vendors are preparing to meet the new regulatory requirements of prescribers. But compliance alone does not guarantee patient safety.
Clinicians and pharmacists need well-designed e-prescribing tools that take advantage of the best technology has to offer and fluidly respond to clinician workflows and conventions.

E-prescribing systems that fully exploit drug knowledge capabilities will be desirable products that help fix deficiencies in the medical system without tying the hands of caregivers or burdening them or their patients with unnecessary restrictions or information. Prebuilt prescriptions, flexible alerting, fine-tuned allergy interoperability, appropriate vocabulary, and automatic checks for dosages and contraindications can be lifesaving tools. They are also tools that benefit from a stepped approach to implementation that does not overwhelm well-proven processes.

**FDB—Working to Fulfill the Promise of E-Prescribing**

FDB is helping to fulfill the promise of e-prescribing through drug knowledge that supports user workflow and provides clinical screening at the point of care. We believe that a world free of medication errors involves effective collaboration with system developers, clinicians, and other healthcare decision-makers. And, we approach our contribution to healthcare by configuring drug knowledge in ways that optimize drug therapy.

To learn how FDB supports its vendor partners, other system developer partners and healthcare providers engaged in e-prescribing, visit [fdbhealth.com](http://fdbhealth.com)

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**Footnotes**


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For more perspectives from FDB, visit [fdbhealth.com/insights](http://fdbhealth.com/insights)