

# CHAPTER 1

## Introduction

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### **CONSIDER THESE QUESTIONS ABOUT E-PRESCRIBING...**

- *It is in the news, and there seems to be pilots going on everywhere, but is it right for you?*
- *Will it allow you and your staff to use time more efficiently and help you take better care of your patients?*
- *If e-prescribing has such great potential to improve patient care, why aren't we all using it?*

This workbook is designed to help answer these questions, as well as to help you in the selection and the implementation of e-prescribing in your medical practice. It is specifically intended for the small- to medium-sized medical practice for which the integration of computer technology may be the greatest challenge.

### **ELECTRONIC PRESCRIBING: A BRIEF HISTORY**

Physicians have been writing prescriptions for medications since the U.S. Food and Drug Administration (FDA) began regulating drugs more than 50 years ago. Prescription writing has increased in the U.S. every year, and currently clinicians write more than 4.5 billion prescriptions annually.<sup>1</sup>

Physicians first began remotely communicating prescriptions to pharmacies by telephone in the 1950s. (See an expanded e-prescribing timeline in Appendix A.) The first e-prescribing system, developed by SAIC (Science Applications International Corporation) for the U.S. Department of Defense in 1987, included rudimentary decision support and could send prescription information to pharmacies connected to the same computer system when they were located in the same facilities. In 1991, computerized provider order entry (CPOE) began at Beth Israel Deaconess Medical Center (Boston, MA) and included both inpatient and outpatient ordering. Several

basic systems became available from a number of companies about that same time, with one of the largest efforts implemented by Walgreens, Co., which implemented a DOS-based product called *Pre-Scribe*.

Over the following years, many other e-prescribing products were developed and marketed. These products generally depended on printing processes or on FAX (facsimile) for communication to pharmacies.

In 1995, work on standards that addressed the electronic communication of prescription information to pharmacies (the SCRIPT standard) was begun by the NCPDP, an ANSI (American National Standards Institute) accredited standards development organization. The first patent for e-prescribing was filed in 1997. Thereafter, a number of small companies began marketing e-prescribing products to physicians throughout the late 1990s and early 2000s, but these usually were unsuccessful because of the lack of direct electronic connectivity to local pharmacies and the lack of up-to-date formulary information, among other reasons. There was considerable consolidation and merging of such organizations during this time.

The environment underwent its next major change in 2001 when both SureScripts and RxHub were formed and, along with other companies, began offering services to directly link e-prescribing software to pharmacies and PBMs (pharmacy benefit management organizations), as well as beginning to integrate health plan formulary information. Passage of the Medicare Modernization Act (MMA) in 2003 resulted in a significant increase in attention and focus on e-prescribing by the U.S. federal government. Since that time, a great deal of work and activity around finalizing standards and removing barriers to e-prescribing has been done. (See Chapters 2 and 3 for more information on this topic.)

## WHY NOW?

At the same time that efforts have been continuing to both improve e-prescribing systems (by adding decision support and increasing usability), as well as increasing connectivity to pharmacies and health plan information, there also has been increased identification of the areas of medical safety that e-prescribing can address.

### Electronic Systems for Data Control

*“A physician who reads all day long for six weeks will already be a century behind.”*

–D.F. Criswell, 2002

Physicians are required to read a staggering and continually increasing amount of information to stay current with recommended practices. More than 40,000 Medline citations are added every month, 1 to 2 new drugs approved by the U.S. FDA each week, and a dozen or so changes in indications, etc., for current medications already approved each week as well. In addition, a rapidly increasing number of diagnostic tests and patient specific data are available for the clinician to consider. It is clear to physicians

that implementation of information systems within practices is the only way the health community is going to be able to master time and efficiency and improve patient care.

### **Electronic Systems for Increased Safety**

Patient safety is a major consideration for the implementation of e-prescribing. What statistics support this? Between 1.5% and 4% of prescriptions are found to contain errors that could result in serious patient risk. Adverse drug events (ADEs) occur in 5% to 18% of ambulatory patients, resulting in costs that exceed \$2 billion/year.<sup>2</sup> Although more than 4 billion prescriptions are written, patient compliance is poor and, therefore, more than 1.1 billion prescriptions are never filled. Poor compliance to medications results in worsening patient outcomes, further increasing the burden on our healthcare system. In addition, patient satisfaction is declining and more patients are turning to alternative remedies that often lack scientific evidence to support their use and may result in poor outcomes for patients with chronic diseases.

More than 8.8 million ADEs occur in ambulatory care settings each year, of which more than 3 million are thought to be preventable. Correspondingly, 1 of 131 ambulatory patient deaths can be attributed to medication error.<sup>2</sup> In 2003, an article by Gurwitz et al<sup>3</sup> showed that as many as 25% of patients experienced ADEs; 13% of these were considered to be serious with 39% of the total considered to be either ameliorable or preventable. In the same year, Gandhi et al<sup>4</sup> published data that showed that 28% of ADEs were preventable, including 42% of the most serious.

Most of these errors result from miscommunication between providers, pharmacists, and all of the other individuals and technology involved in trying to transfer information between them. These communication errors are most often a result of illegible handwriting, incoherent abbreviations and dose designations, unclear telephone or verbal orders, or ambiguous orders and fax-related problems.

The problem has worsened because of the continued increase in the number of prescriptions that are written. There were 823 million visits to physician offices in the U.S. in 2000.<sup>5</sup> It was found that four of every five patients who visit a physician leave with at least one prescription,<sup>6</sup> and 65% of the U.S. population (91% of Medicare) use at least one prescription medication each year.<sup>7</sup> As would be expected, most transactions for prescriptions are for refills, with the next most common transaction being new prescriptions.<sup>8-10</sup>

## **THE PRESCRIPTION SYSTEM: PHONE CALLS AND FAXES BY THE MILLIONS**

The current inefficient process of using paper, telephone, and FAX for communicating prescriptions has a significant impact on productivity. In a typical physician practice more than three hours per day can be lost to these processes. In a pharmacy, more than four hours per day can be lost with as much as one call required to a physician office to resolve a question per each prescription when dealing with multiple health plans and complex formularies.

Indecipherable or vague prescriptions may result in pharmacists making more than 150 million calls overall to physicians asking for clarification.<sup>8</sup> The number of

prescription-related telephone calls made annually is estimated at 900 million, and on average nearly 30% of prescriptions require pharmacy callbacks.<sup>9,10</sup>

What does the current prescribing process involve? How does this change with electronic prescribing? Figure 1-1 demonstrates the main features of the current paper-based electronic prescribing process compared to the electronic prescribing process.

Most patients and physicians view the prescription process as a simple transaction (as outlined in Figure 1-1). The physician writes the prescription, the patient takes it to the pharmacy and receives his or her medication. In reality, the process is much more complex.

The initial prescription requires decision making by the physician that may lack key information such as other medications the patient may be taking, possible drug interactions, health plan formulary restrictions and current treatment guidelines. Many times physicians are also required to obtain prior authorization to give medications that health plans may have restricted access to.

The process becomes even more complex when patients request renewals of prescriptions that require special health plan authorizations. The delay in authorization can result in patient noncompliance (see Figure 1-1).

When fully electronic prescribing is used, decision making can take advantage of multiple electronic resources and clinical decision support tools known to decrease errors including drug-drug interaction checking, health plan formularies, treatment guidelines and “best practice” recommendations, etc. (Figure 1-2). In addition, any questions from the pharmacist can be resolved while the patient is at the pharmacy and renewal requests can also be responded to quickly, potentially resulting in improved patient compliance.

## **SAVINGS FROM E-PRESCRIBING**

Studies show a 14% to 88% increase in formulary adherence with e-prescribing implementation.<sup>11</sup> CITL (the Center for Information Technology Leadership) has published a comprehensive report calculating potential savings from e-prescribing.<sup>2</sup> Savings from preventable ADEs has been estimated to be as much as \$4 per member per year (Table 1-1).

## **BARRIERS TO USING E-PRESCRIBING SYSTEMS**

Clinicians worry about the cost of buying and installing e-prescribing systems, as well as the need for long-term support. They also are concerned about the lack of reimbursement for the costs, time, and resources required to choose, purchase and implement these systems. In addition, clinicians wonder how to find the time required to use an e-prescribing system to write prescriptions, as well as how to access the clinical decision support that can result in improved patient safety. They must also face issues of reduction in productivity, at least initially, while learning the system, as well as the total cost of implementation. Clinicians are unable to gauge how much time it will take to review the warnings, alerts, and recommendations that the systems provide. They also will need to develop new ways to deal with the potential of shared medication, allergy and problem lists when multiple physician practices share patient information directly

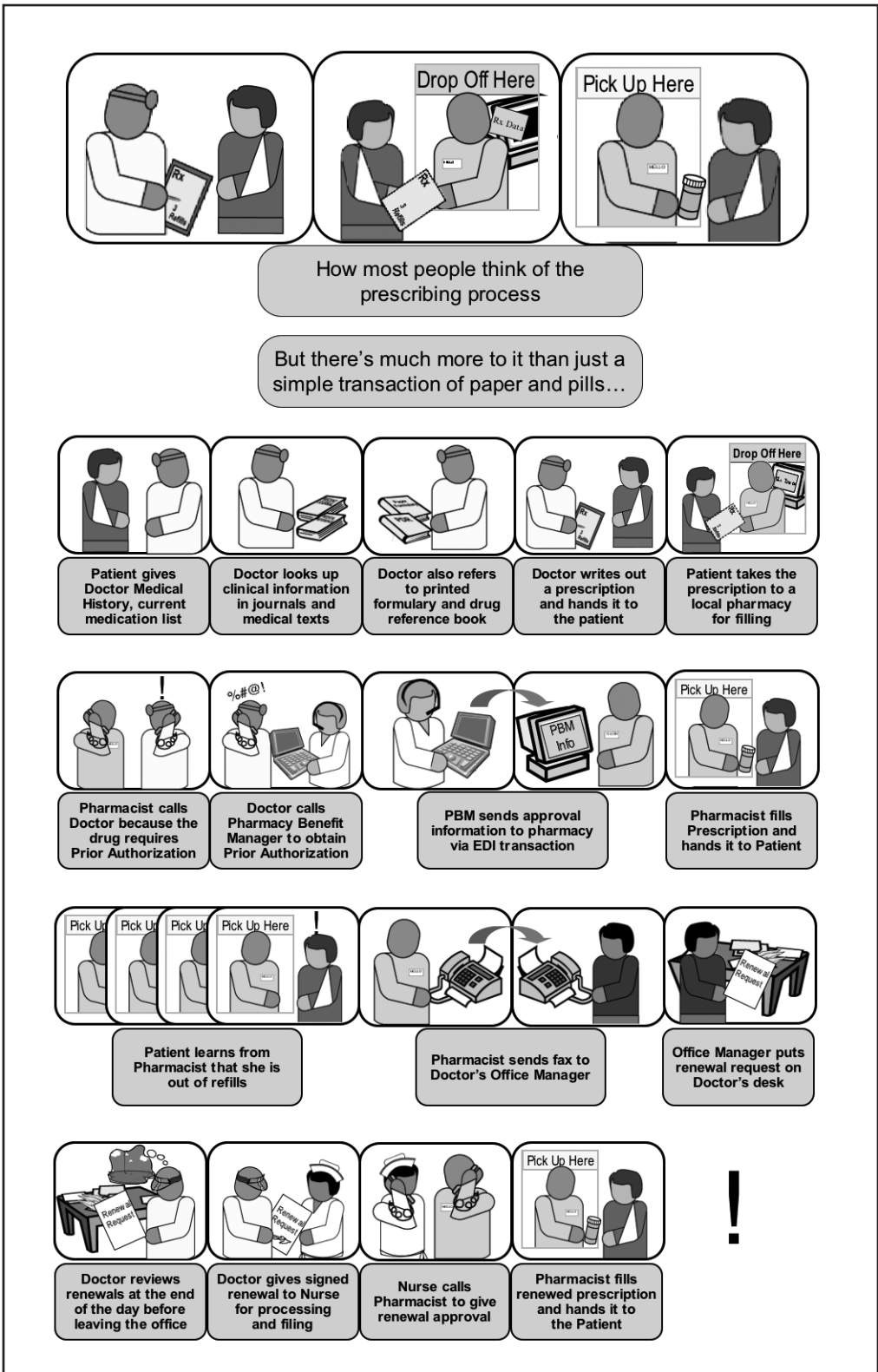
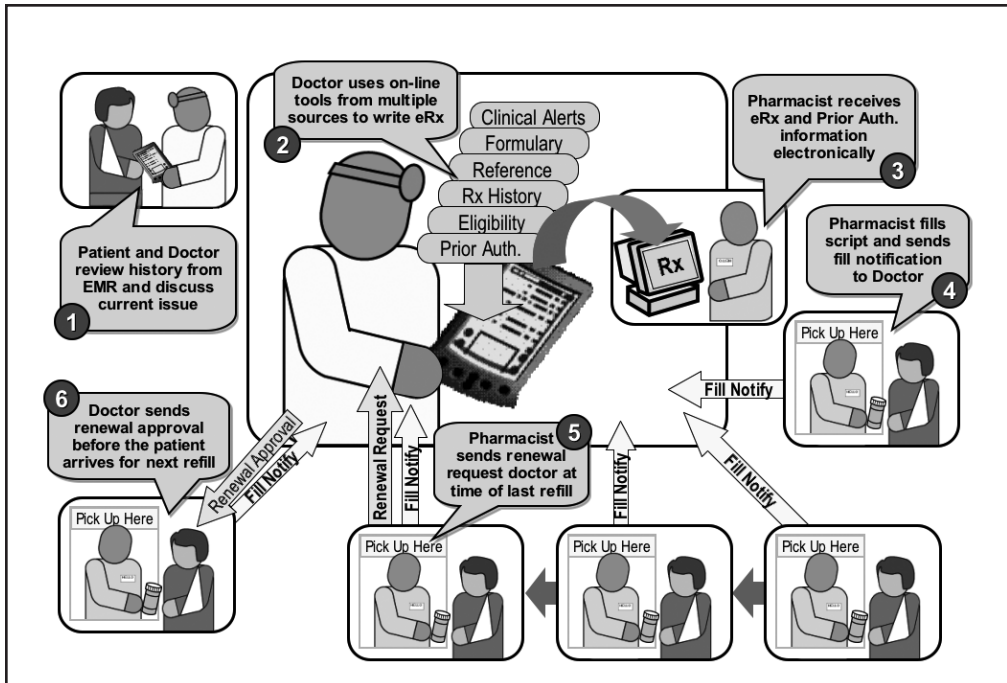


Figure 1-1. Current Rx Process (Used by permission from Ross Martin, Pfizer.)



**Figure 1-2. True E-Prescribing: All Electronics, All the Time**

**Table 1-1. E-Prescribing Savings from Preventable Adverse Drug Events<sup>2</sup>**

<ul style="list-style-type: none"> <li>• 906.8 million ambulatory visits per year (includes emergency, urgent care, etc.)</li> <li>• 823.5 million visits to physicians' offices</li> <li>• 2 million ADEs could be prevented using information technology</li> <li>= \$4.00 per member per year savings generated from preventable ADEs</li> </ul>
<p><b>Savings from Over/Underuse of Medications</b></p> <ul style="list-style-type: none"> <li>• 10% average rate of overused medications which are medically unnecessary</li> <li>• \$35 to \$70 per member per year net savings generated from overuse and underuse of medications</li> </ul>
<p><b>Net Total Estimated Savings from E-prescribing</b></p> <p>= \$39 to \$74 per member per year</p>
<p><b>Most financial benefit goes to payors (estimated to be approximately 89%); only approximately 11% goes to clinicians investing in the systems.</b></p>

through connections between their information systems. Because e-prescribing is still not considered a routine standard of practice, adoption has continued to be slow.

## INCENTIVES FOR USING E-PRESCRIBING

The landmark report on patient safety published by the Institute of Medicine in 1999, *To Err is Human: Building a Safer Health System*, targeted e-prescribing as one of the most important measures that could be taken to improve patient safety.<sup>12</sup> Since that report was published, there has been increased interest by the government, health plans, employers, and others in accelerating the move toward e-prescribing. Many economic

and policy incentives are becoming available to help promote the use of e-prescribing by physicians. (See Chapter 2 for more information on this topic.)

### **ECONOMIC INCENTIVES**

Currently, grant programs mostly include opportunities from the U.S. federal government through AHRQ (Agency for Healthcare Research and Quality ) and CMS (Centers for Medicare and Medicaid Services). State programs are also emerging, as well as a constantly expanding list of programs funded by health plans or employers. For example, a program sponsored by General Motors targeting more than 6,000 physicians in Michigan was recently announced. Also, statewide programs have been announced in Massachusetts, Rhode Island, Nevada and elsewhere.

Many programs concerning reimbursement for utilization, and/or pay for performance are becoming more readily available. These include pilot programs by CMS, as well as health plan and employer group programs, such as “Bridges for Excellence.” Some programs include malpractice insurance premium reductions, but these remain uncommon. Other types of economic incentives that have been suggested include discounts by healthcare IT suppliers and pharmacies and by transaction brokers, each helping to defray costs. There have been recent efforts by CMS and other government agencies to formulate exceptions to Stark regulations and anti-kickback rules to allow hospitals and other organizations to help with the costs of buying and implementing e-prescribing systems for physician offices.

### **POLICY INCENTIVES**

Accreditation can act as a strong incentive to bring groups together for e-prescribing efforts. The 2005 Hospitals’ National Patient Safety Goals (JCAHO) program that requires medication reconciliation for transfer of patients between different care settings (including inpatient and outpatient) has been a strong incentive for hospitals to join in regional efforts to promote e-prescribing and the development of community-wide medication lists. The IHI (Institute for Healthcare Improvement) “100,000 Lives” campaign to increase patient safety is another program that recommends e-prescribing. The campaign is an initiative to engage U.S. hospitals to commit to implement changes in care that are proven to improve patient care and prevent avoidable deaths. Part of the recommendations included automated physician medication ordering not only in the inpatient setting but also for outpatient clinics and emergency care centers. The MMA and other Medicare policies include recommendations for economic incentives to promote e-prescribing and require insurance programs for Medicare Part D to prepare to participate in e-prescribing by 2007. At present there is no mandate for clinicians to use e-prescribing.

### **THE TIME IS RIGHT**

Many of the pilot programs and individual trials using e-prescribing in the past left physicians frustrated and feeling abandoned. This was particularly common in the late 1990s and early 2000s when small companies were approaching physicians with the offer of free software and hardware but no connectivity. So what is different now? Why

should physicians reconsider trying e-prescribing, although using a system failed for them once? Table 1-2 lists the reasons why e-prescribing efforts failed in the past and what has changed that makes it worthwhile to consider trying again.

**Table 1-2. E-Prescribing Adoption: Why Did Systems Fail; What Has Changed and What Will Change in the Future?**

Why Did Systems Fail?	What Has Changed?	What Will Change?
Few pharmacies were prepared to connect to physicians electronically. Most communications were made using telephone or FAX.	More than 85% of U.S. pharmacies have the technology in place to allow them to participate. Computer applications between prescribers and pharmacies may now communicate with each other via electronic data exchange (EDI).	All pharmacies will be prepared to accept e-prescriptions. Pharmacists will develop work flow to include real time communication with physicians.
Internet access to send prescriptions to pharmacies was not commonly available.	Broadband Internet access is now more commonly available in physician offices and pharmacies, even in rural areas.	Broadband Internet access will be readily available everywhere allowing clinicians to prescribe easily while at work, home or traveling.
Formulary information was either not current, not available, or not specific enough.	The sharing of patient-specific formulary and benefit information is available electronically through an industry standard.	In addition to specific formulary information, authorizations for restricted medications will either be eliminated or also done electronically in real time.
Most systems only addressed half the problem by being limited to sending new prescriptions.	Now bidirectional information flow allows renewals to be automated in addition to new prescriptions.	All processes will include bidirectional communication.
Software failed to support the work flow in physician practices.	Software integrates with existing practice management systems, and/or is included in EMR (electronic medical record) systems.	Physicians will include e-prescribing with use of EMRs and share information through RHINs.
Most physician practices experienced few tangible benefits.	Physicians and staff save time as well as improve patient safety when e-prescribing is fully implemented.	P4P (pay for performance) and other initiatives will transform the reimbursement process and provide incentives for e-prescribing.
Vendor stability was an issue.	Consolidation has occurred with fewer but more stable stand alone e-prescribing vendors and increased functionality added to major EMR systems.	E-prescribing stand alone and EMR vendors will use common standards to share information.
No clear path to future additional benefits existed.	Collaboration is occurring between clinicians, pharmacies and payors on patient compliance and other future functions. RHINs (regional health information networks) can include shared patient medication lists between physician offices as well as between care settings (inpatient and outpatient).	More physician practices will move toward EMR.
No incentives to use e-prescribing were available.	Pay for performance and e-prescribing specific incentive programs are becoming more common.	Incentives will be commonplace and support long term use of e-prescribing with clinical decision support.
Automation was driven by a few health plans and small-sized software vendors.	Federal legislation (MMA) and state-wide initiatives involving all major stakeholders are helping to overcome barriers and improve the e-prescribing process.	Multiple initiatives will continue to push for systems that provide improved function, enhanced safety, and increased cost savings.

## HOW TO USE THIS BOOK

Each chapter in this book has been designed to provide useful background information, as well as specific suggestions to help you decide which product to choose and how to implement the system.

In Chapter 1, we discuss the types of errors and issues e-prescribing can address. E-prescribing systems are needed to help clinicians handle the dramatic increase in data that is necessary for decision making in patient care, including information on new medications and changes in the recommendations of existing medications. Most patients leave a physician visit with a prescription, but many do not fill or take their medications. E-prescribing systems can help clinicians in this area by giving fill data, allowing clinicians to address noncompliance. When fully implemented, these systems can significantly decrease errors and improve office efficiency, with office phone calls for correction of prescriptions or refill requests dramatically decreased. Many challenges still exist in implementation of e-prescribing, but many of the most serious problems have been overcome. Most pharmacies can now receive e-prescriptions and send electronic refill requests. Full featured e-prescribing is becoming more common in EMRs as well. Detailed formulary information, down to the patient specific level, also has become more available, and the overall usability of the systems has improved.

Chapter 2 covers federal and state legislation and initiatives. This is a rapidly evolving area with changes underway at every level. The federal activity has occurred in two major areas: The MMA has resulted in CMS pushing for completion and testing of standards for e-prescribing and also working to decrease obstructions, such as Stark laws and anti-kickback issues. A number of state programs and initiatives include statewide e-prescribing adoption plans as well as modification of state rules and regulations.

Chapter 3 provides a basic knowledge of the issues around standards and some information about the major standards efforts involved for such prescribing. This is another rapidly evolving area, as CMS pushes to get the standards in place and pilot tested in 2006 and finalized for use in 2007.

Chapter 4 includes information about the basic elements in e-prescribing systems. It covers the components of simple systems as well as the added benefits of more complex systems, especially in terms of added clinical decision support. More detailed information on clinical decision support is available from other HIMSS products, including a book on the topic<sup>13</sup> and a previous AMIA (American Medical Informatics Association) white paper on CDS (clinical decision support) for e-prescribing.<sup>14</sup> Appendix B also includes a table from the white paper on this topic.

Chapters 5 to 7 include tools and information on selection, contract negotiation, and implementation of systems. Several tools to assist in these processes are included in the Appendixes.

Chapter 8 features three case studies that are specific examples of e-prescribing implementations in different settings, along with discussion of critical lessons learned.

Chapter 9 talks about the future and what we may expect to see, not only in the near future, with development of current plans, but also what things may look like when broad implementation allows for new types of systems and use.

Chapter 10 is a summary including some information on e-prescribing from recent studies done by the RAND Corporation. The Appendix includes a series of practical tools for evaluating, purchasing, and implementing e-prescribing in a practice.

## SUMMARY

Systems have improved, connectivity has improved, and there are more opportunities to join in projects and to receive incentives. Is it time for you to consider bringing e-prescribing into your office? The following chapters will provide further information on specific topics related to e-prescribing, as well as information needed to choose and implement the appropriate system for your practice. At the end of each chapter a list of specific actions you may take to begin this process is included. The Appendices include more detailed information on some topics as well as checklists and worksheets to help with the steps recommended in the chapters. We hope that this book will give you the tools to feel more confident about proceeding with e-prescribing and ultimately to successfully implement your own e-prescribing project.

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