# The Pharmacy Informatics Primer

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With a Foreword by Karl Gumpper

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Because of ongoing research and improvements in technology, the information and its applications contained in this text are constantly evolving and are subject to the professional judgment and interpretation of the practitioner due to the uniqueness of each pharmacy's role in compounding sterile preparations and the handling of hazardous drugs. The editors, contributors, and ASHP have made reasonable efforts to ensure the accuracy and appropriateness of the information presented in this document. However, any user of this information is advised that the editors, contributors, advisors, and ASHP are not responsible for the continued currency of the information, for any errors or omissions, and/or for any consequences arising from the use of the information in the document in any and all practice settings. Any reader of this document is cautioned that ASHP makes no representation, guarantee, or warranty, express or implied, as to the accuracy and appropriateness of the information contained in this document and will bear no responsibility or liability for the results or consequences of its use.

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# Dedication

To Razvan, Matei, and Calin—their patience and support during this process has been my inspiration. And to my dad, Iosef Ciuca—he would have been so proud.

# Acknowledgments

The writing and editing of *The Pharmacy Informatics Primer* could not have been accomplished without the tireless energy, enthusiasm, patience, and cooperation of my contributors. Each of them took time of away from their lives to write on topics that are key to the future of pharmacy practice. Their dedication to the profession is truly inspiring, and it has been an honor to work with each of them.

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# Table of Contents

# Preface

In doing informatics presentations at various pharmacy and information system vendor conferences, I have been frequently struck by the commonality of questions that are asked by audiences after each presentation. Regardless of the topic on which I was presenting, the same questions would often be asked after each presentation. Further, in reviewing published pharmacy informatics literature, I had often been frustrated by the lack of practical application pearls. Too often, the literature presents abstract ideas that are difficult to visualize and operationalize in a health-system setting. By the fall of 2005, I had concluded that someone should write a book that captures the answers to those questions and provides real informatics application tips to pharmacy managers. When I was approached by ASHP in late 2005 to submit my ideas for a book to them, I was thrilled. I submitted a proposed table of contents that addressed the general categories of pharmacy informatics issues, corresponding to the questions I had received over the years. I just did not anticipate that the unknown author/editor of such a publication would be me. After much encouragement from ASHP, I agreed to work on the project, and I am very grateful to their team for the opportunity. I believe that *The Pharmacy Informatics Primer* will fill a much-needed void in pharmacy management literature.

The intended audience is primarily pharmacy managers and pharmacy information technology (IT) project managers. However, the book is also an excellent resource for pharmacy students exposed to pharmacy informatics for the first time, especially since pharmacy schools add informatics to their curricula. The intent of the publication is to provide readers with practical knowledge that can be applied immediately within their organizations.

The concepts presented in *The Pharmacy Informatics Primer* are meant to be used every day, in real-world situations. Although each chapter provides an introduction to the technology or management issue being presented, the core information focuses on practical implementation and technology usage issues. This information is what is often obtained in informal discussions with project and operations managers at conferences or dinners. To facilitate the use of the practical concepts presented, main points of each chapter are also summarized in a Pearls section in each chapter. This can serve as a quick reference for a busy pharmacy manager who needs a bottom-line answer to "how do I deal with bar coding?"

I recommend that pharmacy managers, IT project managers, and students utilize the following steps in applying the principles presented in the chapters:

1. Read the chapter that focuses on the technology you will be implementing or with which you are having issues.
2. Review the Pearls table and make a copy that can be placed on your bulletin board for daily review.
3. Compare the concepts/ideas presented in the chapter with your own organization. What are the similarities? What are the differences? What will work at your institution? What needs to be changed?
4. Plot your own course of action, based on the answers to the questions above. If you reach an impasse or have trouble answering those questions, team up with other managers in your organization to help facilitate discussion and brainstorming sessions. You may also contact the author of the chapter or myself for further guidance.

My goal is that pharmacy managers and pharmacy IT project managers will no lon-

ger feel that they must "reinvent the wheel" with each new IT project implementation. In most cases, other organizations have gone before you, and your organization can learn much from someone else's experience. I also hope that this publication will inspire a new generation of pharmacists to enter the informatics field. As more technology is developed to support clinical workflows (as opposed to reworking clinical workflows to support limited technology), there is a great need for experienced clinicians and managers to bring their knowledge to the informatics field. I hope that students will consider this as a future career path.

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# Foreword

As a clinical pharmacist, I have found many uses for technology in my practice. As a pediatric practitioner, I have used technology to compound parenteral nutrition solutions and to verify the safe prescribing of medications for our smallest patients. The use of technology in patient care is quickly evolving. Whether a clinical practitioner or a manager, today's pharmacist must rely on technology to perform his or her job duties effectively and efficiently.

Pharmacists have been routinely utilizing computers and automation since the 1980s to complete many tasks in providing care to patients. As the medication use process becomes more complicated, technology and automation may help make this system safer and more efficient. In 2006 the ASHP Board of Directors approved the formation of the Section of Pharmacy Informatics and Technology, which provides a membership community to ASHP members who work with information systems and technology in hospitals and health systems. The section has quickly grown to meet the needs of its members in all areas of pharmacy informatics. Members represent a broad spectrum of backgrounds and experience from pharmaceutical industry, academia, manufacturing, consulting, and hospitals and health systems. Members are pharmacy clinicians, managers, directors, technicians, analysts, students, and residents.

Many are interested in pharmacy informatics as a growing subspecialty in pharmacy, as evidenced by expanded requirements for our schools of pharmacy and growth of PGY-2 pharmacy informatics residencies. There is a need to better educate all healthcare workers about healthcare information technology and informatics. The medical and nursing professions are involved in defining the role of physicians and nurses in the development and implementation of health information systems. *The Pharmacy Informatics Primer* will help define some of the primary issues that all disciplines need to consider and work together.

*The Pharmacy Informatics Primer* is designed to be a starting point for pharmacists, residents, and students to explore the changing environment that many practitioners are experiencing. The authors have provided practical examples to illustrate the use of specific technologies in caring for patients in both an inpatient and outpatient environment.

As pharmacy moves forward, each pharmacist will need to evaluate where technology and automation will fit into his or her institution's practice model. The way pharmacists and technicians work at present may be entirely different in the future. Careful planning should be considered during the acquisition, implementation, and maintenance of these systems to ensure the system provides an optimal level of safety. This primer provides sound advice to the reader to evaluate not just the technology being considered for deployment but also the medication use process in its current and future states. When considering the deployment of a CPOE system, the institution must evaluate the impact of that system on the physician, nurse, pharmacist, and even practitioners that do not typically handle medications.

All healthcare institutions must begin evaluating the need for technology and automation in their environments. Those hospitals and health systems that have made the investment in technology should be expected to pave the way for other institutions by sharing their experiences with the profession and others. The reader of the primer will gain an appreciation for the complexities of these information systems. The use

of CPOE, BCMA, CDSS, eRx, and robotics are available in many institutions. There is no right or wrong implementation strategy, but all institutions should be encouraged to start planning.

With the complexities of patient care that are evolving in gene therapy and genomics, the use of technology should aid the pharmacist to ensure appropriate therapies are ordered and provided to the patient to optimize his or her care. The integration of these technologies at the point of care will also allow for a greater access of information that will ensure safe and effective care. Since there are many companies providing these solutions, these systems must be interoperable and function without fail.

*The Pharmacy Informatics Primer* is an excellent resource for the novice and seasoned practitioner alike and is a reference in planning for the acquisition of technology or the enhancement of existing technologies. As expected, the use of technology will continue to grow and change at a rapid pace. When you think about the initial size of computers taking up whole rooms compared to today's tools being held in your hand, the rapid change in technology is mind boggling. One must keep in mind that research needs to be continuously conducted to demonstrate the value of technology on patient care. Remember, the introduction of technology is not without its positive and negative consequences and should always be implemented with patient safety foremost in the minds of pharmacists.

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August, 2008

## Additional Resources

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