

# Improving Outcomes with Clinical Decision Support: An Implementer's Guide

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Dr. Sittig is a founding member of the Improve-IT Institute, a collaborative research initiative that attempts to provide the evidence that increased information technology capabilities, availability, and use leads directly to improved clinical quality, safety, and effectiveness.

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programs, conducting research and development in clinical decision support systems, and lecturing at international meetings. In addition, for the past eight years he has worked principally in HL-7 and with other organizations, such as the California Healthcare Foundation and the National Immunization Program of the U.S. Centers for Disease Control and Prevention, to develop standards and promote their use in healthcare computing. In addition to teaching internal medicine and medical informatics at CSMC and UCLA, Dr. Jenders applies this experience to the development of decision support systems and electronic health records at Cedars-Sinai Medical Center.

# Preface

Much of the sustained enthusiasm and support for health information technology during the past several years stems from landmark reports in the 1990s demonstrating the ability of such technology to prevent errors, reduce adverse events, and improve the quality of care. In almost all of those landmark studies, the gains came directly from the application of clinical decision support (CDS) interventions—reminders, alerts, constrained choices, tailored forms, just-in-time references, and more—to common medical processes. In the trend-setting Institute of Medicine (IOM) reports, *To Err Is Human* and *Crossing the Quality Chasm*, CDS was endorsed as one of the most powerful tools available in the national quest toward improved patient safety and healthcare quality.

The premise is correct: new studies demonstrating the positive impact of CDS continue to appear in the literature. However, its impact on a national scale has been muted to date, with a resulting delay in some of those expected major improvements. Implementation of CDS in hospitals, practices, home care, and other settings proceeds slowly, with great difficulty, and with more than a few bumps in the road. Without a common framework from which to work, each organization must discover for itself the key steps needed to gather the right stakeholders together, to find CDS interventions that are acceptable and effective, to manage their testing and implementation, and to demonstrate their positive impact.

At the same time, developers and vendors of CDS-bearing applications, such as clinical knowledge bases and computerized provider order entry (CPOE) systems, re-invent their own particular wheel, each one trying to produce effective interventions and presentation formats from a mixture of personal experience, anecdotes in the literature,

and empirical guesses. Without a shared body of knowledge, practical lessons learned in one setting are difficult to apply elsewhere. Both the production of CDS systems and their implementation are, in many ways, hit-or-miss processes, with failure still a distinct possibility. Recent reports about “unintended consequences” of healthcare information technology further highlight the urgent need to get CDS implementation right the first time, every time.

This book is intended as a response to this need. The authors have seen these processes and pitfalls repeated many times over—sometimes many times over at a single institution. We began working together on this project in the winter of 2003 as friends and colleagues who had many decades of collective experience working to improve healthcare outcomes through CDS interventions. This experience reflects a variety of different perspectives, including those of healthcare providers and delivery organizations, vendors of clinical information systems and clinical knowledge content, standards organizations, and academic medical informatics laboratories. Our goal was, and remains, to create a focal point for distilling the collective wisdom about successful CDS implementation into practically useful guidance. We were pleased to join forces on this effort with the Healthcare Information and Management Systems Society (HIMSS), which has devoted its own considerable talent and resources to supporting and facilitating the project. It is our hope that by collecting best practices and key lessons, building a common framework, and putting it all into a step-by-step guide, we will be helping you to avoid common mistakes and to create highly effective CDS, smoothly and efficiently. We also hope that the framework and classifications in this guide will become a basis for sharing research and experience about CDS successes and failures, so that lessons learned at one organiza-

tion can be used by others without having to repeat the same experiments.

We are pleased at the response to the first edition, known as the *Clinical Decision Support Implementer's Workbook*, which was published in 2004. Many readers have told us that they have followed that guide closely as a user's manual for their own CDS programs and projects; others have appreciated the single-book compilation of lessons and strategies covering the entire CDS project cycle. In this second edition, re-titled *Improving Outcomes with Clinical Decision Support: An Implementer's Guide*, we have made a major effort to strengthen the usability and value of the book as a practical guide for CDS implementers, and as an important resource for system developers and CDS researchers as well. In particular, this edition adds detailed examples throughout to illustrate the use of the worksheets and forms, and much more on the categorization and practical use of objective classes and interventions, which are key concepts in selecting the best intervention for a given situation. Many new topics requested by readers have been addressed, including governance and management for CDS programs, knowledge management, cost justification, and ensuring that anticipated benefits are realized.

None of the words in this book would have appeared in print without the help of many persons besides the authors listed on the cover. In particular, we want to acknowledge the deep contributions of our teammates at HIMSS—Gail Arnett, Pat Wise,

and Fran Perveiler, and our chief editor, Mary Kelly. They have provided support, know-how, experience, and just plain hard work to make this vision come alive. We would like to acknowledge Michael Chase, Jim Cimino, Tonya Hongsermeier, Alan Peres, Kirk Rasmussen, Cali Samuels, and Doug Thompson for helping develop some of the key ideas in this edition of the book. We would also like to acknowledge the thoughtful review and helpful input of Joseph Ketcherside, Hyung T. Kim, Manlik Kwong, Gil Kuperman, Robert Murphy, Tom Payne, and Andy Steele. We also, of course, gratefully appreciate the support of our families, co-workers, and employers, who supported us as we devoted many hours to this work.

In addition, we are grateful to all of the readers who wrote in with helpful comments, suggestions, and proposed additions. We have tried to incorporate many of those suggestions in the current work, and we encourage you to continue to send feedback and ideas that can be incorporated into future revisions. For us, this book is not a finished work; rather, it is a springboard into a number of other activities designed to help CDS fulfill its original promise: to be a vitally important, routinely used tool that helps bring the best care to the largest number of patients. We hope you will continue to be our partners in that journey.

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