

Prologue

Technology and Medication Safety

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This volume comprises papers devoted to the development and use of technology—principally health information technology (health IT)—and strategies to enhance medication safety, both of which are critical to improving the delivery of safe, effective health care.

We are already using health IT in a number of ways: to help prevent medical errors, including adverse drug events; reduce costs through streamlining processes and providing more targeted, efficient care; help patients manage their chronic illnesses; enhance the delivery of targeted, patient-centered care; measure provider and facility performance; and facilitate rapid access and dissemination of accurate medical information in the event of a public health emergency.

Health IT can provide access to real-time information to support clinical decisionmaking, promote evidence-based care, organize and streamline the referral process, facilitate the order entry process, and consolidate patient information into one easily accessible, accurate, and up to date source. The use and usefulness of health IT are evolving, and we certainly will see many new applications of health IT in the coming months and years. New forms of information packaging and presentation will be critical in helping health IT grow and develop as health care itself changes over time.

Many examples of health IT in action are included here. Topics range from the use of hand-held assistive technology to the implementation of decision support systems and the application of health IT in the operating room. Other authors focus on the challenges that must be faced and overcome if we are to make the most of health IT and its seemingly limitless potential to improve the care provided by the Nation's health care system, including: costs (particularly start-up costs, which can be substantial), provider resistance, concerns about privacy and the security of health data, and the unintended consequences that can sometimes occur.

These barriers can, however, be overcome. For example, one paper examines the impact of implementing an electronic health record (EHR) system on work processes and patient care in a busy labor and delivery unit. Other authors describe the positive effects of computerized provider order entry (CPOE) on turnaround times for laboratory, radiology, and pharmacy orders. Concerns about confidentiality and system reliability are addressed by several groups of authors.

Several papers focus on anticipating and overcoming the unintended consequences that sometimes result from the implementation of health IT. For example, one paper discusses the development and implementation of a homegrown CPOE system that was designed to minimize unintended consequences and maximize the potential of e-prescribing

technology to improve patient safety. System reliability and safety are the focus of an article that introduces the concept of “safeware”—a comprehensive approach to hazard analysis and the design, operation, and maintenance of the hardware and software systems involved in health IT.

The second half of this volume is devoted to medication safety. Medication prescribing is the most frequently used therapeutic intervention, and the majority of office visits result in a prescription. Indeed, pharmaceuticals are an essential tool available to clinicians to treat acute illnesses and manage chronic conditions. Yet the use of medications—including prescription and generic drugs, as well as herbal supplements—is not without risk. Underuse, overuse, adverse events, and medical errors associated with medications can cause serious harm to patients and increase health care costs.

Medication errors are a frequent cause of adverse drug events, and they can occur at any point in the process—i.e., during ordering, transcription, or administration. Many approaches have been proposed and tried over the years to improve medication management and minimize adverse drug events, ranging from increased involvement of pharmacists, to e-prescribing technologies, to computer-based medication monitoring.

Authors in this section approach the problem of medication safety from several different angles. They describe systems to detect potential errors, prevent the dispensing of inappropriate medications, monitor respiration and dispense patient-controlled analgesia (PCA), and monitor the medication use of Medicare beneficiaries at high risk of adverse drug events. One group of authors examined the feasibility of detecting medication errors through self-observation of office transactions along with chart review in a primary care practice that did not use electronic ordering. Another paper reports on a multicenter trial to evaluate a medication therapy management program that included pharmacist visits for seniors at high risk for drug-related problems.

Still other papers focus on the benefits and drawbacks of automated medication dispensing machines in hospitals; the use of “smart” PCA pumps with continuous respiratory monitoring in postoperative patients; the feasibility and usefulness of a community-wide electronic shared medication list that is portable and accessible to patients, caregivers, and health care practices; the development, use, and outcomes of a medication safety program that attempts to imbed research in practice; the utility of home visits to learn more about medication errors in children; the need for and role of pharmacists in emergency medicine; and the risks associated with using prescription drugs with herbal and dietary supplements.

In summary, the papers in this volume present a wide array of approaches that use health IT and other mechanisms to improve the delivery of safe and appropriate care, improve medication safety, and make the most efficient and effective use of America’s scarce and ever more costly health care resources. The authors represented here are working on finding tools and solutions that will move us forward and help us achieve a safer, more efficient health care system that is second to none.