

# Preface

*If I have seen a little further it is by standing on the shoulders of Giants.*  
—Sir Isaac Newton

Why should you read this book? Maybe you are planning a single hospital implementation of Computerized Provider Order Entry (CPOE) and want to pick up a few pearls. Perhaps you are with a large health system and are tackling a new project affecting all or most of your facilities. Alternatively, perhaps you want to assess as to what level of fool would tackle a project to rollout CPOE to 25 community hospitals, “big bang” over 28 months. The day I am writing this Introduction (August 2, 2011), our 26th hospital (yes, 26th) went live on house-wide CPOE, less than 25 months after our first CPOE pilot. In addition, our hospital physicians are all using CPOE with a company-wide average of less than 13 % verbal/telephone orders.

This book is about the process of making a complex project like this, or any other CPOE project, a reality. It is not the work of one person, but rather requires a team, leadership, clear vision, dedication, commitment, external drivers, experience, and the tireless work of those before us in this industry, who have paved the way with both successes and failure. Only by standing on the shoulders of the giants can we see beyond ourselves and achieve big goals. I like to sum it up humorously with a principle that has guided me in this project: “Do what has been shown to work in the past, and don’t do what has been shown not to work.”

This book is not a scientific reference guide into medical informatics, but rather a practical guide to visioning and executing successful automation of physician workflow in hospitals. This is not a book on theory or a summary of research studies in the field. Much smarter persons than I in the field have contributed the research and efforts to bring us through the last 30 years from the first CPOE system to the commercially supported systems of today. We all are indebted to them. There will be points in this book where I challenge conventional “wisdom” in the area of implementing CPOE. In the end, I hope that my peers will see this as an opportunity for dialogue and further study.

I once heard a motivational speaker tell a story about a wise executive who was quite successful at running his company.

An employee asked, “How is it that you have been so successful at your business?” The executive answered, “I find it important to only make good decisions!” The employee then asked, “How did you find a way to only make good decisions?” “Oh, that was simple,” answered the executive. “Early in my career, I made lots of bad decisions.”

Throughout the book, I will be sharing hard lessons-learned and guide you through the early warning signs that will help you avoid the pitfalls. Unlike the wise executive above, I continue to make the occasional bad decision and learn from my mistakes. As systems progress, and the regulatory environments change, there will be new challenges and opportunities that will confront you in your efforts to automate physician workflow. However, there are principles such as vision, leadership, project management, and change management that will always need your attention for project success.<sup>3</sup>

Moreover, I would like to set the book up with a little prologue, so you will know a little more about the author and the team, how we came to tackle system-wide CPOE more aggressively than we might have otherwise. I hope this provides some useful context to these teachings in this book. My journey was not through traditional medical informatics training, but rather through a series of eclectic events. So my apologies up front to my many colleagues who are more scholarly in the field. Your contributions to the industry have been many and great, and I thank you for your passion into designing better systems and constructs for our future end-users.

My journey in medical informatics began in November 1993 when I converted my family practice office in New Port Richey, Florida, from paper to an electronic medical record (EMR). That first year, I found myself more productive and more profitable, and really caught the bug. Back in 1993, using an off-the-shelf EMR, I was keeping electronic problem lists, medication histories, allergies and reminders. Pharmacists were amazed that patients arrived with printed prescriptions and medication safety information. And patients who lived in Florida only during the winter (we refer to as “snowbirds”) returned north each spring with a printed summary of care that today we would call a continuity of care document (CCD).

What was particularly useful to learn was the power of information in transforming care even within a single office of two physicians at that time. Though not particularly related to CPOE, a brief summary of some of these may yield some clues about my early passion for the EMR:

We quickly learned that we had 76 phone calls a day into the office and that over half we had seen in the office in the prior 48 h. Of this latter half, the process typically was that the patient would call the receptionist (front-office staff), who would then transfer the call to the nurse (back-office staff), who would then take a detailed message and promise to call the patient back after speaking with the

---

<sup>3</sup> I strongly encourage physicians in the field of informatics to join AMDIS, the Association of Medical Directors of Information Systems. Their conferences and discussion groups at [www.amdis.org](http://www.amdis.org) are a priceless resource, and we encourage you to join.

doctor. Then the nurse would catch the appropriate doctor between patients, and jointly we would attempt to reconstruct what occurred at the prior visit, since prior to the EMR the dictation of the visit was typically pending at that time. Once the doctor devised a plan, the nurse would attempt to call the patient back (and this was before the popularity of cell phones) and relay the physician's advice. Overall, it often took an hour or two to close the loop as well as our nurse spending about 8–12 min per call and often longer.

We instituted a practice that each day the physicians would indicate patients on our schedule that our office nurse would call the following morning between 8 and 9 AM. These patients were either work-ins (i.e., sick and worked into the schedule acutely) or patients on whom we started new medications or treatments. Because the encounter visit was in the EMR, as well as structured and clear, the nurse could quickly call each patient proactively and inquire, “How are you feeling and do you any questions or concerns?” The patients loved this service and saw us as a team that cared for them. Moreover, the time the nurse spent per patient was typically 1–2 min, freeing up much time and effort.

The second opportunity involved patient flow and our ability to design a better schedule for our patients. Each physician had about 10,000 active patients. We would see about six work-ins daily in addition to our pre-scheduled appointments. Through electronic scheduling we were better able to devise a schedule that not only allowed us to see the walk-ins daily but stay close to our scheduled time with our planned patients for that day. For us, we built a modified-wave schedule, which had six appointment slots per hour – three at the top of the hour, two at 20 min after the hour, and one at 40 min after the hour. This allowed us to stay on time even though patients sometimes arrived later for their appointments. Each hour, we left one slot that was open and we could only schedule after 3 PM the prior day. As a result, we had a work-in slot for every hour, and patients soon learned that we could see them the same day if sick. When there were open slots, we used these to complete insurance inquiries or other paperwork. An unintended, but positive, consequence of this was that patients rarely called us after-hours (i.e., evenings or weekends) for medical advice. True emergencies went to the Emergency Department, and others knew we could see them at their convenience the next day.

The other big “ah-ha” was the difference in productivity between two physicians with similar patients and the same EMR within the same office. Within 1 month of implementing our EMR, I was typically finished with all documentation for my 28–35 patients that day and out the back door about the same time that the final patient was checking out with the receptionist. The net result was that I shaved about 2–3 h off my daily office schedule. Prior to the EMR, I would often go home with a stack of charts that I would dictate that evening, since I invariably did not do my dictations real time. Once the EMR was live, I found that I would take my history, do my exam, then document while the patient was in the room. I frequently found that I had additional questions I could then ask of the patient. My documentation became better since I was no longer trying to recall the patient from among a day's work while dictating in the evening. In

addition, I took the time to note a more personal item in each record that would better connect me to the patient at a future visit. I would say, “Mrs. Jones, how is your niece doing in her first year at Harvard?” Typically, she would reply, “Oh, Dr. Smith, how do you keep track of all these things?”

I would also personally demonstrate to patients how the computer would perform drug–drug and drug–allergy interactions on new prescriptions, as well as producing a variety of patient education leaflets. By involving the patients, they soon saw that the EMR as a benefit, and not an intruder, into the patient–physician relationship. Yet even today I see physicians and nurses complaining about the EMR in front of patients, rather than promoting the opportunities the EMR affords to medical decision making and patient care.

In 1994–1995, I had my first opportunity in hospital clinical systems implementation through chairing the physician informatics committee at our local HCA (Hospital Corporation of America) as we deployed Meditech’s clinical system throughout the ten hospitals of Tampa Bay. I found the experience energizing and saw a bigger picture as we were able to share secure patient information across hospitals and well as remotely access the system from the office. That year I became a 2-year transition from practicing medicine.

During 1999 through the first half of 2001, my friend Martice Nicks and I spent much of our waking hours developing business process models of how health information and data currently flowed and could flow if the industry was committed to unify under a seamless information management model. Our company, Cognitive Analysis, Inc. (CAI), brought together people from different disciplines to look at transforming health information management. Martice, coming from nuclear environmental engineering, and I, from healthcare, shared a common vision of tackling this fragmented cottage industry. We recognized the complexity of the healthcare industry and began to apply concepts that the nuclear power industry had leveraged following the Chernobyl and Three Mile Island accidents. We found encouragement in the Institute of Medicine’s *To Err is Human...*<sup>4</sup> report in November 1999 and in the Business Roundtable’s formation of the Leapfrog Group.<sup>5</sup> However, running low on cash, and venture capital gone due to the “dot.com” bubble bursting, we dissolved CAI in mid-2001 and I went to work for Cerner Corporation, as a physician executive on the Care Transformation Team.

While at Cerner, I had the opportunity to first identify ways to optimize existing clinical information installations, while having a hand in early adoption of CPOE on a commercial platform. Not only did Cerner leadership have a great vision for the future, but the drive and dedication of associates was endless. Cerner has a great culture of innovation and collaboration and the Care Transformation Team was at the forefront of optimization and change management.

In 2003, I transitioned as a physician in consulting at Cerner Corporation into a dual role at the Adventist Health System (AHS). I became the Vice President of

---

<sup>4</sup>IOM. *To err is human: building a safer health system*. Institute of Medicine Report. 1999.

<sup>5</sup>Leapfrog Group for Patient Safety at [www.leapfroggroup.org](http://www.leapfroggroup.org).

Medical Affairs at the East Pasco Medical Center (now Florida Hospital Zephyrhills) in Zephyrhills, Florida. Simultaneously I would contribute my knowledge at the corporate level as the Chief Medical Information Officer (CMIO). I had previously consulted with AHS in my role at Cerner and befriended its Chief Medical Officer, Dr. Loran Hauck, an industry pioneer, who had first published positive outcomes of utilizing clinical pathways (today, evidence-based medicine) through paper-based order sets,<sup>6</sup> another of those giants in the industry. I also had the blessing to report to Brent Snyder, senior finance officer and chief information officer, for AHS and another true believer in cutting-edge clinical information systems.

The second blessing came in March 2005 when we were ready to launch our first CPOE site in May. We found that there was a possibility that another health system would acquire the pilot hospital by end of year. Knowing how these things work, it seemed unreasonable to bring up a medical staff on CPOE knowing that there was a high likelihood that their new owner would rip out their CPOE system and replace it with a standard EMR (electronic medical record), since most health systems were not ready to embrace CPOE in 2005.

Some very special experiences came from that ordeal, however. First, I realized that the whole concept of an admission order set was flawed. My experience to that time was in making “soup to nuts” order sets that included everything you needed to admit a patient with a condition such as pneumonia or heart failure. The “ah-ha” however was patients today almost all have comorbidities, such as the patient with pneumonia, worsening his heart failure and his diabetes. In the paper world, we just ignored duplicate orders. However, in the electronic CPOE world, this creates endless reconciliation of duplicates by the ordering physician. There had to be a better way. Therefore, we developed our “plug and play” model (see Chap. 2) that other health systems would adopt, and we still use today.

We also realized that we would need to create a sustainable model to produce large-scale order set content and maintain it across 37 hospitals (soon to be 44 hospitals). We wanted a reproducible model that we could highly leverage. We will discuss that topic further in Chap. 2.

Therefore, we proceeded to install our EMR model, minus CPOE, through January of 2008 to 25 hospitals in a very rapid, “big bang” fashion, and put CPOE on the back burner for the next 2 years. In addition, I left my dual role and became a full-time CMIO in August 2007 to focus on CPOE planning. This gave us late 2007 and all of 2008 to plan for two house-wide hospital pilots in early 2009. What I had gained, though, as a VP at Florida Hospital Zephyrhills was an appreciation of the culture, climate, and operations of a community hospital within AHS. This knowledge proved very useful in planning a large-scale, rapid rollout of CPOE across 26 hospitals in nine states. Moreover, if you were counting, you saw we started with 25 hospitals and ended with implementing 26. In addition, we have five new (four through merger/acquisition) hospitals on tap for 2012. We will automate

---

<sup>6</sup> Hauck LD, Adler LM, Mulla ZD. Clinical pathway care improves outcomes among patients hospitalized for community-acquired pneumonia. *Ann Epidemiol.* 2004;14:669–75.

them with our full suite of revenue cycle and clinical systems, including CPOE, physician documentation, and bar-code medication scanning.

In this book, I will share CPOE experiences, and then point out some key principles and lessons learned along the way; not only from the AHS project but also from other CPOE projects in my career. My hope is that you will read the book once, and then refer often to the different chapters to deal with opportunities that will help you right now with a current project and provide some thoughts for your future project. In addition, each chapter concludes with a “fingernails on the chalkboard” section of warning signs that you should heed. I hope that these will provide some reality and humor during this process.

As we journey together, I will be introducing you to a variety of books and resources that will help you find your way. I can only hope that you find this book useful to you, your team, and to your many future successes. Moreover, I look forward to your comments and thoughts on the topic via email: [phil@medmorph.com](mailto:phil@medmorph.com).

August 2, 2011