

## LA Story: Cedars-Sinai Takes the Plunge to CPOE

### *Executive Summary*

One day next spring, life will change at Cedars-Sinai Health System in Los Angeles, when a \$20-million integrated hospital information system called PCX, for Patient Care Expert, goes live. Thanks to the computerized physician order entry (CPOE) module at the system's heart, from that day forward, doctors won't be able to order so much as an aspirin without doing it electronically.

This issue of *Information Edge* provides a case study of the choices Cedars-Sinai made over the last several years that have brought it to the brink of CPOE, driven by the need to better manage resources and a new California law requiring hospitals to invest in technology that minimizes medical errors. We'll look at why Cedars-Sinai chose to build a system, factors that went into designing and building it and the importance of sustained support from executive and clinical leadership in seeing the project through to completion. The health system took several steps to start weaning 2,000 physicians from paper. After discussing its features, we examine how Cedars-Sinai expects the system to pay for itself in four years, and why, despite its early embrace of new technology, Cedars-Sinai is in no hurry to adopt a totally electronic medical record.



### **Pre-existing conditions**

The information challenge facing the Cedars-Sinai Health System was to find a way to link its 820-bed hospital, four medical groups with 2,000 non-employee physicians caring for more than 125,000 managed care lives, and several wholly-owned subsidiary corporations.

In 1997, Cedars developed a set of technology architecture guidelines that its authors, in a presentation to the American Medical Informatics Association last fall, compared to a municipal building code. "While a building code does not specify that any particular structure be built, in the event that someone decides to build something, the code specifies certain critical standards that

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must be met in the design and construction process. In the same way, an enterprise technology architecture is not a plan and does not require anything to be implemented. Rather, it requires that certain standards rules are followed once the decision to invest in technology is made."

One goal of the guidelines was to constrain technology choices to avoid creating a Tower of Babel. Thus Cedars embraced two universal technologies, according to CIO Doug Jones: Web browsers as a universal user interface and Oracle servers at the back end. Betting on browsers may seem obvious now, but entailed some risk in 1997, less than two years after Netscape launched its initial public offering. That commitment proved prescient, as many physicians and others who will use the new system already know how to use a browser.

In 1998, Ray Duncan, MD, Cedars-Sinai's director of architecture and technology, developed a Web Viewing System. Web/VS is a software program that enables physicians and caregivers to access patient data from a personal computer at home or in the office via the medical center's secure Web server. Not long after Web/VS was launched, Cedars-Sinai introduced Palm/VS, designed for Palm Pilot wireless devices. Web/VS now receives 25,000 hits a day (up from zero two years ago).

### **Promoting a sense of urgency**

Using Web or Palm/VS physicians can pull up consultations, surgical results and emergency room reports as well as hourly information on heart rate, blood pressure, ventilator settings and blood gases for ICU patients. Other information includes an operating-room schedule and patient census. To ensure patient confidentiality, Cedars-Sinai physicians must obtain a digital certificate, provided by Cedars-Sinai's secure Web server and containing encrypted information about the physician and his or her account. Once physicians have logged in, the server tracks all entries into Palm or Web/VS and provides daily audit reports for entries into patient accounts or test results.

As Cedars moved more data to servers accessible to Internet-connected PCs and Palm Pilots, the inability of legacy systems to adapt to a Web/server-based environment became a growing problem. "We couldn't provide enough information to meet demand. Wait times for access and timeliness of data began to drive our architecture development," says Jones. Cedars-Sinai saw the need for an information system that could use the capabilities of the Web to put clinical data more quickly into clinicians' hands.

At the same time, Cedars-Sinai saw CPOE as a next logical step, a tool that could help assure that carefully developed clinical guidelines were being followed. That decision has since been validated by—but wasn't driven by—external pressure. "We cite the Leapfrog Group and the Joint Commission to promote a sense of urgency within our organization and a sense of the value of what we're doing," says Paul Hackmeyer, MD, Cedars-Sinai's chief of staff. At the end of this year, he'll take the reins as chair of the health system's Safety Council, which will monitor the CPOE system's impact on patient safety.

“Cedars-Sinai’s first goal in choosing a system was assuring a safe environment of care for our patients,” says Michael Shabot, MD, who takes over as chief of staff in January and has led the medical informatics program for the organization. “Another primary goal was ease of use for physicians and other clinicians. We made field trips to Brigham and Women’s and Mass General hospitals in Boston, to Indiana University Medical Center and to LDS in Utah.” Brigham and Women’s and LDS (Intermountain Health Care) are both Scottsdale Institute members.

### ‘Stunning technology’

The problem was that Cedars’ needs were ahead of vendors’ products. “A couple of years ago, we decided to move to CPOE, but no systems were available that were browser-based, and the non-browser systems were too expensive,” Jones says. Existing products had evolved over time and failed to fully exploit the opportunities presented by meeting Internet standards, he says. “We tried to convince the vendors to sell us their business logic so that we could build our own system with a browser interface. But the vendors weren’t interested.”

Cedars-Sinai decided to move forward with internally designing and developing PCX, using a variety of technologies.

The Cedars PCX system will include four modules:

- **Patient management.** Includes pre-registration, verification of insurance eligibility, registration, admission for inpatients, transfers, and census management
- **Computerized physician order entry.** The clinical heart of the system incorporating guidelines developed by Cedars physicians
- **Medical record coding and abstracting.** 3M-based product that makes the billing process more accurate
- **Patient accounting.** Includes billing, collections and payments to providers

### As big as penicillin

CPOE represents the most dramatic change in how doctors will practice at Cedars as a result of the new information system, says Hackmeyer. “A lot of the billing and financial systems that we’re putting in don’t affect our physicians’ day-to-days lives. CPOE is different. It touches me and every other clinician at Cedars-Sinai directly. This will be the most important addition to the practice of medicine in my lifetime. It’s as big as penicillin or sulfa drugs.”

The switch from pens to bytes was hard for some physicians to accept. “The first thing out of the mouths of some doctors is ‘You’re going to kill my patients,’” Hackmeyer says. “To which I point out that we’re actually going to improve patient safety.” Langberg adds that some physicians probably opposed the use of telephones or fax machines when they were introduced too.

### SI Member Saint Vincent in the Heart of WTC Tragedy

Our prayers and support go out to Saint Vincent Catholic Medical Centers of New York which, as the closest hospital to the World Trade Center, received the heaviest trauma load of any hospital in Manhattan as a result of last week’s terrorist attack. President and CEO David Campbell and staff performed in a heroic fashion, as many of us witnessed from the TV coverage.

### IT Cost Benchmarking Database Available:

Scottsdale Institute members can now enter data into the database and compare your organization with others. Please contact Cynthia Pratt at 763-422-6761 or at [cpratt@fcg.com](mailto:cpratt@fcg.com) to obtain your username and instructions for accessing the database.

*“CPOE will be the most important addition to the practice of medicine in my lifetime.”*

Cedars has taken a series of preliminary steps to prepare its physicians for the transition to CPOE, each with the goal of steadily weaning physicians from paper.

- Starting January 1, 2001, any physician serving on a medical staff committee was required to have an email address to continue serving. A few refused.
- All medical staff, executive and CME committee agendas, minutes and associated documents exist only in electronic form.
- Cedars-Sinai eliminated printed laboratory cumulative reports that added another piece of paper to a patient’s chart for every blood count and lab result. “Before moving to exclusively electronic lab reports, we held focus groups and training classes, offered plenty of advance notice, made department-specific changes as needed and had our IT people on the patient care floors to help answer questions,” Langberg says. “Physicians had a lot of worries up front, but within a couple of weeks, the complaints stopped. We learned a lot about how to communicate change. A few months later we did the same thing with imaging reports and images.”

### **CPOE is the law**

Physician response was predictably mixed, with 20% of doctors enthusiastically embracing the changes, 10% described by one administrator as “absolute Luddites” [a reference to the 19<sup>th</sup> century English workmen who destroyed labor-saving machinery as a protest] and the rest in the middle. Some doctors have complained that Cedars-Sinai is putting CPOE in only to save money, says Hackmeyer. “My response to that is first, there’s nothing wrong with prudently managing financial resources; second, in California, CPOE is the law, so we have to do it [California Senate Bill No. 1875 requires most hospitals in the state to adopt a formal plan for minimizing medication-related errors as a condition of licensure by Jan.1, 2005. The plan must include “technology implementation, such as, but not limited to, computerized physician order entry or other technology”]; and third, CPOE does more than save money. It will help reduce medical errors.”

Sitting physicians down and showing them what the system will do also helps. “We have enough of the system built so that we can show parts of it to physicians,” says Beth Hallman, director of implementation for PCX. “We can show the doctors how it will work and what it will mean for their daily lives. That engages them.”

Perhaps more challenging than winning over physicians has been overhauling non-clinical processes, says Jones. “Formerly manual processes will be automated and processes that were supported by mainframes and terminals are moving to the Web interface.”

Patient management and accounting processes have been not only manual, but also disjointed, says Jeannette Polaschek, RN, director of informatics and PCX project manager, creating the need for extensive process redesign. “First we map the current process, and sit down with the users and explain how

#### **IT’S NOT TOO LATE TO REGISTER:**

Scottsdale Institute CIO Fall Meeting in Chicago, October 24-25. If you haven’t registered yet, or you would like to get more information about the meeting, please contact Cynthia Pratt at 763-422-6761 or at [cpratt@fcg.com](mailto:cpratt@fcg.com).

things could change. We ask them if the changes make sense, and if users can adapt to them. We create an end-to-end map of the new process, and we write programs for granular aspects of the process for users to play with. There has been a lot of rapid prototyping.” Getting the appropriate business owners to carve out the time needed to sit down with programmers has proved to be a challenge.

#### **Not 1984**

The point person for measuring the performance of the PCX system is Shabot. “Once we’re live, we’ll measure every aspect of the system that’s measurable,” he says. “Our primary purpose will be to catch patient order errors at the point of ordering. So we will record every instance in which a physician placing an order receives a warning advisory from the system about possible allergies, drug-drug interactions or other possible errors. We will record whether the physician heeds or overrides the warning, and the clinical outcomes of the patients involved.”

“Our goal certainly isn’t any Orwellian setup where Big Brother is always watching our doctors,” Shabot says. “Any warning about a proposed course of treatment that the system issues is based on clinical guidelines developed by our medical staff. A doctor who ignores them and gives three antibiotics instead of one is choosing not to practice evidence-based medicine based on standards set by peers.” Cedars-Sinai has received a grant to help offset the cost of documenting the new system’s impact on the number of errors.



In addition to clinical benefits, Cedars-Sinai expects to recoup its \$20-23 million investment in PCX in three to four years, says Jones. “That’s just hard dollars, and doesn’t include any savings from improved patient safety.” The savings will come from reduced accounts receivable days, recovery of dropped and lost charges, and increased revenues resulting from more accurate coding.

Once PCX is broken in, other systems slated for replacement include the non-ICU medication administration record (MAR) and legacy materials management and scheduling systems. But a full transition to an electronic medical record is not a high priority. “Some parts of the chart certainly will be electronic, but I don’t see the EMR in and of itself as a useful goal,” Jones says. Langberg agrees, noting that once PCX is online, “the only things left on paper will be occupational therapy, physician notes and nursing notes. The work it would take to digitize them would be enormous. When a physician dictates notes, people can overhear. That’s a problem. On the outpatient side, there’s greater theoretical value in an EMR because it provides easier access to data for multiple doctors and offices.”

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## Guiding Principles:

Six principles guided the design of Cedars-Sinai's technology architecture:

### Timing Perspective—Long Term vs. Short Term:

- Overall, CSHS' technology guidelines will be based on medium- to long-term goals
- Short-term fixes that are inconsistent with these Enterprise Technical Architecture Guidelines (ETAG) will be minimized
- Specific business cases will be made for short-term fixes that are inconsistent with the ETAG

### Build vs. Buy:

- Preferred option is to buy a system
- Fall-back option is to build a system

### Flexibility vs. Cost Efficiency:

- The focus will be on operating cost efficiency over user flexibility
- Increased central control of standards and purchasing will be sought

### Standards:

- Technical and operating complexity and costs will be minimized through standardization of products and services provided and supported

### Centralized Control vs. Distributed Control:

- CSHS technology strategy will move toward a more centralized control model as enterprise-wide systems and technology standards are developed

### Position on Technology Lifecycle:

- CSHS will allow the prudent use of leading edge technology

## Conclusion

The Cedars-Sinai leadership team that spent the last year and a half building PCX—and before that Web/VS and Palm/VS—agree that several factors have contributed to their success to date.

- **Be sure of support from the top.** “From Tom Priselac, our president and CEO, to the board, to the medical staff leadership, down through the organization, there has been inflexible dedication to moving forward with these projects,” Hackmeyer says.
- **Don't punish slow adopters.** While goals may be fixed, paths to achieving them must be flexible. Hackmeyer recalls being asked by the Cedars-Sinai board of directors how he would handle physicians who refused to use their email accounts. “They were surprised when I said that we would do whatever we needed to do to help bring them along. I think they expected me to take a punitive approach, but that just doesn't work.”
- **Tap tech-savvy physicians.** “When Doug Jones came in as CIO, he drafted the support of physicians who knew both the clinical side and technology,” says Duncan, who in addition to his medical career has worked as a programmer and run a software company.
- **Get some early wins.** “If you're going to cross the cultural Rubicon, make *sure* it's successful,” says Langberg. That was part of the reason for taking relatively small preliminary steps such as moving medical staff meeting materials to the Web.
- **Be honest about tradeoffs.** “It may take 20% longer to place an order at first,” Hackmeyer says. “As an OB/GYN, I probably won't have that problem, because I use a standard order set most of the time. But if you've got a diabetic patient with high blood pressure who needs chemotherapy, there is no standard order set.”



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