

CPOE

CPOE From the CIO Perspective

Voices of experience share what they know and what they're still learning.

by Jane Metzger, Alison Ferren, Ann Sullivan and Bob Schwyn

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The following panel discussion took place at the fall 2003 meeting of the College of Healthcare Information Management Executives in Scottsdale, Ariz. Jane Metzger served as moderator.

Jane Metzger: Success with CPOE [computerized physician order entry] is 20 to 30 percent technology, and the rest requires a partnership between the information systems department and the medical staff. The first question to address is, What are the key ingredients?

Alison Ferren: The IOM [Institute of Medicine, Washington, D.C.] report was a call to action for Abington Memorial Hospital. We reaffirmed patient safety as the top priority, and the medical executive committee gave the medical staff nine months to achieve universal CPOE. (We use the term "universal" because anything termed "mandatory" is doomed to failure.) It was important to communicate this expectation early.

Key to our partnership was asking our physicians, How can we make the system easier for you to use? and then following through. In fact, physicians play a big role in decision-making--on our IS executive committee and a physician advisory group that prioritizes IS requests, overcomes barriers and watchdogs physician participation.

Ann Sullivan: The Maimonides story is very similar. Our CPOE experience goes back to 1993 at Jacobi Medical Center [New York]. At both hospitals, the CEOs mandated CPOE and were visible and deliberate about driving the message that CPOE was a top priority because of patient safety and better patient care.

The need to actively work on physician engagement cannot be overstated. At Jacobi, we started "upstream" by working with the dean of the medical school to create a medical informatics program for medical students and residents. By the time Albert Einstein residents rotated to our hospital, they were computer literate.

I thought I knew how to engage physicians in CPOE until I arrived at Maimonides in 1996--where I faced 1,000 voluntary (community) physicians and an aggressive schedule to move from punch cards to advanced systems. I told the key medical chairmen I would deliver the technology, but they had to deliver

the physicians. The clinical chairmen took charge and continue to this day. Every physician who raised his or her hand was involved in the project in a meaningful way, and we added physicians and other providers to the MIS [management information systems] payroll. We also worked hard to make IT a value-add for physicians, bringing data and PACS [picture archiving and communications systems] to their offices to make their work easier.

Bob Schwyn: Columbus Children's Hospital started out with CPOE in the early 1990s, started again in the late 1990s with another vendor, and after the product was sunsetted, started over again. One lesson along the way was that the effort had to be led by a clinician.

Our breakthrough came with a new CMO [chief medical officer] who, over time, partnered with me, becoming the leader/change agent. After we spent a lot of time thinking about leadership in changing the culture and aligning IT with our strategic plan, a light bulb came on one morning and the CMO said, "I finally get what my role needs to be." From that point on, he became engaged in every project meeting, using his role as the top safety officer to balance priorities among various constituencies. Many times he would say, "We're not leaving this meeting until we get a win-win resolution."

Two other elements were critical. We enlisted two physicians (0.5 FTE each) who had completed their residency at Children's, understood the process inside and out, and knew how to influence the residents--who write 95 percent of the orders. Plus, we created two groups for training, one for nurses and a new one for physicians, in the educational arm that reports to our CMO. As a result, there's clear clinical ownership of education and training.

Metzger: Our second question is, How does an IS department need to beef up skills and reorganize to take on advanced clinical systems like CPOE?

Sullivan: When we began, 100 percent of our IS staff was technical. Today, 38 percent (of 92) is clinical: physicians, registered nurses, nurse educators, and lab, radiology and cardiology techs. We recruited internally because we didn't have a lot of time and needed to show some fast credibility, and these staffers knew Maimonides' workflow.

Our 3.5 FTE educators train 24/7--about 15,000 hours of clinical "training" a year. (We actually call it "education" because physicians don't like being "trained.") We tried to train in two hours, but many older physicians did not understand a keyboard, mouse, or light pen and were reluctant to volunteer for a class. So we created a course on navigation but called it "Navigating the Internet to Access Medical Literature," and we had standing-room only. We offer separate classes for physicians and residents, further subdivided by specialty, because we discovered that physicians do not want to mix. In the end, it's a little psychology mixed with hand-holding. The investment pays off.

We have a standard help desk for desktop calls, but a 24/7 clinical command center staffed by 5.1 FTE nurses who know our EMRs inside and out. (We don't call it a "help desk," because physicians don't like asking for "help.") From the command center, we also monitor interfaces 24/7. I can't tell you how important that investment is, no matter how good your interface team.

Schwyn: Like Ann's group, our team in IS has evolved to a strong base of clinicians. We also have learned the importance of managing interfaces, which we underestimated initially. I don't think it's possible to put too many resources in this area or take it too seriously.

We implemented electronic records and CPOE with what we call "e-chart." A four-person e-chart support team is on-site 24/7, with a trainer and an IT team always on call. The team reports through nursing--an important level of ownership.

A unique difference for us is that e-chart uses fingerprint authentication. The state of Ohio's pharmacy board requires two forms of positive identification. We landed on biometrics fingerprint as being the most

effective technology despite additional support needs. We joke that we are managing 10,000 fingers on one of our servers.

Ferren: At Abington we have 70 FTEs in our IS department, with three areas key for CPOE: clinical systems (13.5 FTEs), interface technologies (5 FTEs) and technical services (16 FTEs). Clinical systems handles help-desk calls and training and is currently implementing our new clinical system. Our interface technologies group is critical as we transition to a core vendor strategy. Technical services was key in upgrading our network infrastructure, also aiding in rollout of wireless devices.

Metzger: System reliability worries keep CIOs awake at night, and the topic has even been discussed in the *New England Journal of Medicine*. The third area we should address is each organization's expectation about reliability. What is the most significant thing you have done to ensure reliability?

Schwyn: This is one area we just started to tackle more seriously. We've got 100 percent of order entry and 100 percent of nursing documentation online, and about 50 percent of the docs are electronically charting all of their notes. Our tolerance for downtime is gone. As I work with our vendors, I'm disappointed by their efforts on continuous computing and redundancy, even the ability to answer questions about how we can make this thing more reliable.

We've labeled an internal initiative "availability/disaster recovery." It's not just about buying more computers or capability. In some cases it's staffing, in some it's change management. The good news is that we are prepared to invest. Going into 2004, we're allocating 25 percent of our capital budget and 20 to 30 percent of our operating budget to redundancy, shoring up availability and disaster recovery. Most staff additions in IS next year are in this area.

Ferren: We're in a similar situation. In 1992, when we had 30 percent of attending physicians using the system, it was OK if it went down because they could go to a green order sheet to write their orders. But when we went to universal CPOE, that wasn't acceptable anymore. We're averaging 99.7 percent uptime now. One significant investment was to make our network infrastructure redundant and upgrade our mainframe to provide physicians the subsecond response times they require. We do more proactive monitoring and have automated a lot of operator interaction with the system to take out the human factor.

Sullivan: We started with a service level agreement of 99.9 percent availability, but nothing less than 100 percent is acceptable for a physician who's totally paperless and relying on CPOE. Although we have been pushing very hard, the vendor community is not really ready to deal with server clustering, SANs [storage area networks] and so forth.

You can't test disaster recovery too much. Our mainframe is in Leona, N.J., not far from Brooklyn. We do disaster plans every six months, test them and go to our cold backup site. So we felt secure that our mainframe was highly redundant, reliable and ready for any kind of disaster. But you learn.

For 9/11, many hospitals in New York lost their computer systems because they were in New Jersey or they were close to downtown Manhattan. We all shared each other's computer resources at that time, but we found out that our mainframe vendor had moved our backup tapes to Manhattan without telling us. So, when Manhattan was locked down, we couldn't get our backup tapes to go to a cold backup system.

During the recent blackout, our server farms and mainframe remained up and running, and we have SONET ring communication through the Lincoln Tunnel and other tunnels to make sure we have full redundancy and communication. The generator in the basement computer room turned out not to have any air conditioning or fan, so we burned out our PACS servers. What's important here is that there's an incredible level of detail to manage.

Metzger: Our fourth question: What process should hospitals use to determine the hardware devices and device locations for CPOE?

Ferren: The first objection raised to universal CPOE was lack of devices on the nursing floors. To respond, we enlisted physicians and nurses to identify needs and locations for wireless carts and desktop devices. We relocated many devices and added more than 100. Finding locations for those in 20+-year-old buildings was a big challenge, because to a clinician, workspace also means writing space, the chart and telephone.

We recently evaluated PC tablets, convertibles--which are the laptops with the fancy hinge--and slate devices on two critical care units. Right away we found nontechnical challenges, such as the logistics of the doctor picking up the PC tablet at the beginning of the day to start rounds and managing mobile devices in isolation rooms. Critical care staff like the wireless carts, and both nurses and doctors prefer convertible devices over slates because they like having a keyboard while rounding.

Schwyn: For nursing documentation, we already had a device at every bedside and a number at each nurses' station. So, moving to CPOE wasn't a big jump. However, the questions of wireless and remote access remain. Because we're running fat clients, we couldn't put them on every desk. We did set aside a pool of money, which allowed us to place devices upon request. The result is that physicians feel we're being very responsive.

Sullivan: Our chairman of emergency medicine says "Hardware is cheap, people are not." Don't be cheap about devices. We started with a formula for device planning but did heavy revision based on each unit's layout and workflow.

Remote access for faculty and community physicians is very important. We give physicians who enroll in Office MACS and Office PACS (EMR and PACS for community physicians) technical support to load DICOM software and whatever else they need to run Eclipsys e7000 into their office computer. So far, 200 of our 983 voluntaries have remote access. They love getting PACS images and radiology and laboratory reports without having to call the hospital. Their admissions have gone up, so we certainly see the value of making remote access easy.

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