CPRs in the Winner's Circle

Award-winning organizations set new standards of care with electronic data capture.

by Fred D. Baldwin

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It was strictly voluntary," says Joy Keeler, associate vice chancellor at the University of Illinois Medical Center, Chicago, on how physicians first accepted, then embraced, a computer-based patient record (CPR) system. "We have never mandated its use. They changed their own way-- peer-to-peer, not top-down. We have driven change with value."

"Driving change with value" also sums up the strategy of other hospital executives who, like Keeler, led their institutions in deploying CPRs that received the Nicholas E. Davies Award (see "How Davies Winners are Selected" below). Applicants must address such workflow considerations as computerized physician order entry (CPOE) and clinical support, and electronic health records must provide the primary source of clinical information for all, or nearly all, affiliated healthcare personnel.

Systems may be configured in different ways. Some recent Davies awardees chose enterprisewide suites from a single software vendor; others stitched together best-of-breed departmental systems. Only one factor appears essential to success: convincing physicians (or maybe encouraging them to convince themselves) that a CPR will save them time and improve patient care. Lack of physician support can mean failure, as one of the nation's largest hospitals, Cedars-Sinai Medical Center, Los Angeles, found out. In February, it announced that physician resistance would delay indefinitely plans to implement CPOE, a critical component of any full-featured CPR (see "Physician Resistance Arrests CPR System" below).

Many healthcare institutions don't get as far as Cedars-Sinai, says Barry Hieb, M.D., a research director at Gartner, Stamford, Conn. Hieb estimates that only 7 to 10 percent of U.S. hospitals have made serious progress toward deploying a CPR to support inpatient care. "For those with a true CPOE," he adds, "which is the touchstone, probably it's more like 1 to 2 percent."

Certainly, money is a huge barrier. A full CPR including a picture archiving and communications system (PACS) can cost tens of millions. But physician skepticism ranks at least as high. "There are systems out there," Hieb says, "that are to the physicians' benefit from a time perspective, but the physician can't see it." What they see is that scribbling down an order and handing it to a nurse takes 30 seconds and that typing it in or using a menu takes a minute. They don't see that calls from the pharmacist--asking what the order says or noting potential drug-drug interaction--have stopped, Hieb explains.

The enterprisewide method

The University of Illinois Medical Center, a 2001 Davies winner, focused from the start on physicians' goals of faster access to clinical information, easier communication among clinicians and patient safety, Keeler says. The doctors told Keeler's team (she was then CIO) that the worst problem was slow turnaround for lab results and radiology interpretations.

Keeler didn't want to develop software in house or buy off-the-shelf components. She needed "not just a vendor but a partner," she decided, and asked Cerner, Kansas City, Mo., to custom-build a system. Her staff and the developer worked together to design a physician-friendly "in-basket" graphic interface. The CPR, called Gemini, is now used by about 90 percent of the institution's 715-member faculty.

"Word-of-mouth led clinicians to the system," Keeler says, "because they could get laboratory results in nanoseconds as opposed to days for hard copy. [Later] our physicians came to us and said, 'We'd like to begin documenting in the system.'"

In 2002, Queens Health Network, which includes Elmhurst and Queens hospitals in the New York City borough of Queens, became the first public hospitals to win a Davies. Diane Carr, associate executive director for healthcare information systems, says that a CPR was essential to expand the network's ambulatory program, now exceeding a million visits a year at 19 locations. All caregivers--doctors, nurses, dieticians, social workers, lab technicians--are part of the system.

Carr began with "resolving the most glaring problems for physicians." She replaced nine best-of-breed legacy systems "that didn't talk to each other" with a common platform from Per-Se Technologies Inc., Atlanta. Now Queens Health is almost completely electronic. The moment data such as text results are sent, Carr says, "they start streaming into the patient's record. You can't get any faster than immediate."

Best-of-breed arrangements

At Maimonides Medical Center, Brooklyn, N.Y., also a 2002 Davies awardee, senior vice president and CIO Ann C. Sullivan took the opposite of Carr's approach, replacing a unified CPR that wasn't being used with several best-of-breed systems. The changes began in 1996 when a new administration decided that cost containment alone was a losing strategy and that Maimonides had to commit to centers of excellence to remain competitive.

Ambulatory care was clearly a growth area. As Sullivan put it: "It's very hard in an ambulatory setting to demonstrate good patient care with a patient chart. You're shipping parts of the chart

all over Brooklyn." The ambulatory care CPR from NextGen Health Information Systems, Horsham, Pa., brought many happy results, one being a 40 percent drop in lab test requests. Doctors had been sending duplicate test requests because results were so slow in coming that they thought the order had been lost. Seeing order status in real time solved that.

Soon Maimonides emergency room docs were demanding an equally sophisticated system and guided the choice of HealthMatics from A4 Health Systems, Cary, N.C. The emergency department is now "99 percent paperless," Sullivan says, "except for some New York City dog-bite forms and forms that the state wouldn't let us modify online."

The obstetrics department chose the Intelligent Patient Record for Obstetrics (IPRob) from Glen Rock, N.J.-based E&C Medical Intelligence Inc. Maimonides doctors deliver more than 6,000 babies a year, and IPRob's documentation capabilities persuaded the malpractice insurer to lower obstetrics premiums.

The Ohio State University (OSU) Health System, Columbus, a 2001 Davies awardee, slashed the time for getting medication to patients by 65 percent, cut radiology turnaround time almost 45 percent with links to PACS, and eliminated transcription errors in intensive care units. "We were showing huge, huge savings by these cycle time reductions," says Asif Ahmad, former CIO at OSU and now vice president and CIO at Duke University Health System, Durham, N.C.

OSU's overall healthcare information system vendor is Siemens, Malvern, Pa., but three others play significant roles: SoftMed Systems, Folsom, Calif., supports medical documentation and electronic signatures; IDX Systems Corp., Burlington, Vt., supports outpatient records; and Agfa-Gevaert N.V., U.S. headquarters in Ridgefield Park, N.J, provides a PACS.

Ahmad urges healthcare CIOs to map goals and workflow before investing in any product. "Many CIOs stay aloof from actual patient care needs," Ahmad says, but IT investments should be approached from the front end, where you're capturing the information. "That will determine how effective you will be." For example, many CIOs don't really know how a CT scanner or an MRI machine works when they should be determining, according to Ahmad, "how the information is captured in each of these places and how it should be easily translated into the main backbone system."

In-house upgrades

The Veterans Administration Puget Sound Health Care System, Seattle, was awarded a Davies in 2000 for work begun in 1997 at what was then the largest test site for the Veterans Administration's computerized patient record system (CPRS). "It was developed in-house, but the 'house' is a very large one," says Thomas H. Payne, M.D., formerly medical director for IT at the VA facility and now in a similar role at Seattle's University of Washington. "There's the critical mass to support a development group."

The VA's current goal is that 90 percent of its medical orders nationwide be entered electronically. Paul Nichol, M.D., Puget Sound's associate chief of staff for clinical information management, says that almost all of the VA's 163 medical centers have met or nearly met that

goal. The CPRS also covers patients in the more than 1,200 other care facilities--clinics, counseling centers and nursing homes--operated by the VA.

All the healthcare executives interviewed emphasize technical support for medical staff during the transition from paper to electronic. For example, Maimonides provided round-the-clock support for three to six weeks in most departments (12 weeks in obstetrics, which has a high percentage of nonstaff physicians). Both Payne and Nichol note that some VA centers provide 24/7 support, and at VA Puget Sound, the phrase "help at the elbow" has become a kind of mantra.

The VA relies for support on "clinical application coordinators." Barely half of them are IT specialists, Nichol notes. Most are IT-savvy clinicians--primarily nurses and pharmacists--rather than staff with a traditional IT background. Physicians readily accept their help, and the coordinators tend to be highly creative in solving problems. Many of their recommendations find their way into the national system through the VA's user feedback process. Payne recalls working with version 0.8 of the software; now, version 21.7 is in testing.

He adds that "as soon as [physicians] pass a certain threshold, they quickly identify 10 new features that they want to have." And when the staff sees a concern addressed, that helps with acceptance. "It sends a signal that it's not a static, you-have-to-live-with-it system. It's one that is constantly evolving."

Paybacks and pluses

In time, CPRs will be regarded as essential technology, but now, it's "a journey," says Margret Amatayakul, president of Margret\A Consulting, Schaumburg, Ill., and former executive director of the Computer-based Patient Record Institute, now part of the Healthcare Information and Management Systems Society (HIMSS). Paybacks come from improved staff productivity and lower administrative costs for functions like records transcription, transport and storage. The big benefits involve quality, such as reduction of errors and better decision support. "Some of these benefits you can translate into dollars and some you can't," Amatayakul says, "but you know that there are dollars underneath."

Davies award winners must demonstrate concrete benefits from installation of a CPR. Maimonides has been careful to benchmark before-and-after results by department and to calculate the effect of change in monetary terms. Maimonides' total investment was roughly $44 million in initial costs, spread over six years. (Sullivan notes that because the hospital had made almost no investment in IT prior to 1996, these numbers include major infrastructure costs as well as a PACS.)

Maimonides analysts calculate a four-year payback period on CPR-related investments. That's conservative, however, because it omits increased revenues generated by better service and more cost-effective use of beds, made possible by reducing average patient stay by 2.1 days. "If we had included that," says Nancy Daurio, associate vice president for management information systems, "you wouldn't believe what the payback would have been."

As examples like this multiply, Gartner sees CPR "taking off and starting to accelerate," Hieb says. All major suite vendors and integrators either offer or will soon offer CPR products. (Hieb mentions most of the vendors already cited, adding Epic Systems Corp., Madison, Wis., and McKesson, San Francisco.) "I would think that by five years from now, it's not unreasonable to think that 30 to 40 percent of the hospital market would be doing this stuff. Once acceptance gets to be something like that, the pressure will be on everybody to do it."

A CPR makes new standards of care possible. For example, the population the Queens network serves tends to be poorer and sicker than the general population, and the staff wants to be proactive in reaching them. "Our CPR is allowing us to move from patient-specific to population-specific disease management," Carr says. "If you don't have information, you can't stratify risks in patient populations. We have 5,700 diabetics, and that population is expected to double in the next five years." In the past, this population couldn't even be identified. "You can't pull 5,700 paper charts and start saying, 'OK, what were their labs in the past 12 months?'

"Cost savings are important," Carr sums up, "but our goal was to improve patient care. We had a strategy that required IT support. Physicians know what they need to take care of patients, and the information system needs to support that. The whole effort is less about technology and more about change management. It's more about people."

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PHYSICIAN RESISTANCE ARRESTS CPR SYSTEM

Patient Care Expert (PCX)--the computer-based patient record (CPR) system developed over several years at Cedars-Sinai Medical Center, Los Angeles, and rolled out in stages--looked like a success story in the making. Its final major component, a computerized physician order entry (CPOE) system, went live last October. But in January, management pulled the plug, at least temporarily, on CPOE--a key component in a complete CPR. Reason: physician opposition.

PCX provides fast access to lab results and images and links clinical operations to all of the hospital's administrative and billing functions. Doug Jones, vice president for enterprise information services and CIO at Cedars-Sinai, says that during its 11 weeks of operation, PCX processed about 600,000 physician orders. For about 30,000 of them, the decision support component raised alerts to possible cross-drug interactions, patient allergies or other medication risk factors. In about 10,000 instances (1.7 percent of the total), doctors cancelled their orders, suggesting that PCX made a real contribution to patient safety. "The system worked as designed," Jones says.

What the system lacked was physician acceptance. Many physicians perceived order entry as being unduly time-consuming, although logs often showed physician-computer interactions to have been quick and efficient. It didn't help that of about 1,800 physicians practicing at Cedars-Sinai, only 600 are faculty or residents. "A lot of physicians are here only occasionally," Jones says, "and didn't get past that learning curve." And he acknowledges that PCX may have

presented a finer level of detail than physicians needed (e.g., multiple names for a drug, specifics required only by a pharmacist).

Most important, PCX confronted differences in operating practices across nursing units and ancillary departments. Personnel can work around procedural inconsistencies, but an automated system cuts no such slack. "There were a lot of systems issues that became very evident," Jones sums up. "PCX uncovered them. It didn't cause them."

A Cedars-Sinai review team composed of physicians, nurses, and administrative staff is beginning to address these issues, but no target date for full restoration of PCX has yet been set. "I think we are determined to turn this back on," Jones says. "We think it's very important to patient safety."

--F.D.B.

HOW DAVIES WINNERS ARE SELECTED

The Nicholas E. Davies award program for excellence in computer-based patient records (CPR) began in 1995, launched by what was then the Computer-Based Record Institute (CPRI)--later CPRI-HOST and now part of the Healthcare Information and Management Systems Society (HIMSS). Eligible healthcare organizations must, in written presentations and during site visits, meet high CPR standards in technology, functionality, management and value, says Pat Wise, director of HIMSS' electronic health record initiative. (Go to www.himss.org for details.)

Initially team leaders for winning organizations tended to be physicians, but recently they've been executives with enterprisewide perspectives, says Wise, who also notes better documentation of paybacks, including financial returns on investment. And, although HIMSS will not release actual numbers, entrees have increased: 2002 had triple the applicants of 2001. There's already been interest in the 2003 awards, says Wise, "which tells me that a lot of institutions are moving in the right direction."

Institutions are judged on their merits, not against each other. "We could conceivably have no winners or many winners," she says. "We'd like nothing better [than to present] 10 awards in a given year."

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