

Defining CPOE

Here's a look at the current state of computerized physician order entry in U.S. integrated delivery systems.

By Sheldon I. Dorenfest

Fueled by health care's growing focus on patient safety, computerized physician order entry (CPOE) has emerged as the industry's newest No. 1 IT priority. The Institute of Medicine's 1999 report on patient safety, *To Err is Human*, brought a national focus to life-threatening errors made in hospitals and was followed by a variety of other patient safety initiatives, including the Leapfrog Group's efforts to make computerized physician medication order entry a mandatory requirement for its constituencies. Now, the question of whether to implement a CPOE system is being addressed in the executive suite of every large hospital.

This article addresses the what, why, how and when of CPOE deployment.

What is CPOE?

The term CPOE applies to systems ranging from the entry of all drug and clinical orders by the physician as part of a broadly defined clinical information system (CIS)/computer-based patient record (CPR) system to the more limited "medication-ordering-only" definition adopted by Leapfrog. So the "P" in CPOE can stand for "physician" or "prescription." Organizations beginning the investigation of CPOE systems should consider all options as they evolve to a CPOE strategy for their hospitals.

Why CPOE?

Studies have pointed out medication errors as major contributors to serious injury in hospital treatment. Researchers

have focused on physicians' handwritten medication orders as a contributing factor in medication errors because of either illegibility or physicians' lack of understanding of the contraindications for a particular medication. Therefore, industry observers hypothesized that a system that eliminated or reduced the possibility of errors from these sources would have a significant impact on medication error reduction.

This line of thinking triggered the industry mandate for computerized medication order entry by physicians. In addition, experts further hypothesized that computer entry of all types of orders directly by physicians would be even more beneficial in reducing patient errors.

State of computerized ordering

Ever since the first CIS and CPR systems were introduced in the late 1960s, developers have been clamoring for physicians to enter orders directly into such systems. In fact, the early systems introduced during the 1960s and 1970s managed to get

a high percentage of physicians entering orders.

Early adopters with a high percentage of physicians entering orders included the following organizations:

- Brigham and Womens Hospital, Boston;
- El Camino Hospital, Mountain View, Calif.;
- Latter Day Saints, Salt Lake City;
- Medical College of Virginia Hospital, Richmond, Va.; and
- New York University Medical Center, New York.

For many years, these early adopters were among a limited number of hospitals that had any type of interaction between physicians and computers within their facilities. During the 1980s, physician computer use broadened as hospitals began providing for physicians to access recent test results and patient census data. The use of computers by physicians to



About the Database

According to Sheldon I. Dorenfest & Associates, Ltd., the IHDS+ database is "the primary source of information about health care IT activities." Used by many companies as the foundation of their sales and marketing information systems, this database contains demographic information describing the overall characteristics of each integrated delivery system in the nation, and contains a variety of important information about their IT programs. This database contains almost 40,000 health care facilities associated with 1,500 integrated health care delivery systems and is updated annually.

access results and census data has expanded to many hospitals since that time. But even today, many physicians may not interface directly with the computer to access these functions. Instead, nurses access the results and give paper copies to physicians.

Meanwhile, physician order entry expanded slowly beyond early adopters. In 2002, a small percentage of the nation's physicians entered some of their own orders into hospital computer systems. When compiling the 2002 version of The Dorenfest Complete Integrated Healthcare Delivery System (IHDS+) database (see sidebar), we asked each delivery system whether physicians were entering orders directly into their computer systems or whether they were still writing them for entry by nurses and unit secretaries. We found that less than 20 percent of the delivery systems had some physicians entering some orders directly

into the computer system, and only a few delivery systems had most of their physicians entering some or all orders into their computer systems.

Why aren't physicians entering orders? (After all, this feature has been available in software products since the early 1970s.) The primary issue is physician time. No currently available systems allow the physician to save time entering his/her orders directly into the computer system; most systems require a substantial amount of additional time.

Because time is their most valuable asset, physicians have opted to continue hand-writing their orders. However, physicians could be motivated to take more time to enter orders directly into a computer system if the time investment could be justified by other benefits. For example, in ambulatory practices with electronic medical record systems available as an integral part of the patient care process, physi-

cians are more motivated to enter orders into computer systems.

The proliferation of physician order entry in ambulatory environments is aided by the simplicity — and fewer number — of orders compared to the inpatient environment. On the other hand, the basis of physician resistance to inpatient order entry, which often is logical and appropriate, must be considered when evolving to a CPOE system.

Other key strategic issues facing evaluators of CPOE include the following:

- What is the level of functionality in the computer systems now available to serve CPOE needs?
- Do we buy a medication-ordering-only system or a system that allows all physician orders to be entered?
- In the case of a medication-ordering-only system, should it be part of a larger CIS/CPR system or a stand-alone system?
- In the case of a stand-alone system, how will it interface and integrate with our current CIS/CPR and pharmacy department systems?
- Should we buy a new CIS/CPR system or expand the current one to accommodate limited or broad CPOE?

Next steps in CPOE adoption

Early results from the first 441 delivery systems interviewed for the 2002 IHDS+ database showed that 37.2 percent had a plan to evaluate CPOE (see Figure 1 for

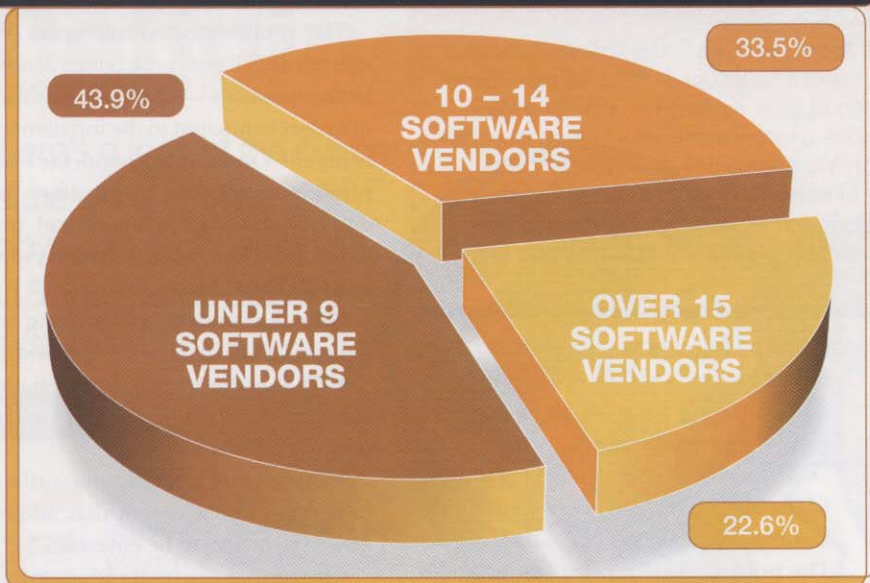
Figure 1

WHAT IS THE CURRENT STATUS OF YOUR STRATEGIC THINKING TOWARD IT SYSTEMS TO SUPPORT PATIENT SAFETY EFFORTS?

	TOTAL RESPONSES	
	NUMBER OF DELIVERY SYSTEMS	% OF 441 DELIVERY SYSTEMS
CONSIDERING ACQUISITION OF CPOE SYSTEM	164	37.19%
REVIEWING NEW CLINICAL SYSTEMS BUT UNCERTAIN OF FEATURES	56	12.70%
NOT SURE YET OF HOW SYSTEMS WILL PLAY INTO PATIENT SAFETY PROGRAMS	221	50.11%
EARLY RESPONDENTS TO 2002 SURVEY	441	100.00%

Source: The latest data from the Dorenfest Complete IHDS+ Database™

Figure 2

HOW MANY APPLICATION SOFTWARE SUPPLIERS ARE USED BY A DELIVERY SYSTEM?

Source: The latest data from the Dorenfest Complete IHDS+ Database™



Since CPOE has only recently emerged as a high priority, currently available systems are in an early stage of development and are not yet ready to meet the high demand that has been created.

additional responses). Since none of these delivery systems had a plan for CPOE in 2001, this indicates amazing new momentum for CPOE.

But since CPOE has only recently emerged as a high priority, currently available systems are in an early stage of development and are not yet ready to meet the high demand that has been created. If a large number of mature CPOE systems were available to service this new momentum, it would still take a typical delivery system a year to 18 months to select the appropriate CPOE system — and another year to 18 months to implement it. Given the immaturity of CPOE functionality, the first purchasers of such systems may struggle with implementation and these initial systems may not meet user expectations. If a hospital adopts CPOE technology now, the organization's attention will be diverted to a longer term solution taking three years

or more to implement, during which time the errors motivating this demand will continue. Therefore, some hospitals are reviewing interim, less risky solutions by asking physicians to sign computerized orders entered by others so that legibility errors can be corrected before the orders are filled and administered.

If more hospitals quickly adopted policies such as this, life-threatening errors could be reduced while CPOE function could be allowed to emerge more naturally. Correspondingly, this would require more appropriate recognition of the true state of the art in CPOE by the industry leaders that are generating momentum for CPOE systems.

If a hospital decides it should implement a CPOE system now, it needs to establish how it should proceed toward successful execution. One issue is integration. In the 2002 IHDS+ database, over 56 percent of

the delivery systems use 10 or more software suppliers (see Figure 2). These delivery systems face integration problems if they choose to purchase a stand-alone medication order entry system that otherwise has the best product features to support CPOE.

If the organization is using a satisfactory CIS from a vendor that does not have strong CPOE function, the only satisfactory routes to CPOE today will be to either purchase a stand-alone CPOE system or a new CIS/CPR system to replace a system that is already working satisfactorily. Neither of these options may be attractive as a solution. This situation could lead to a false or improper start into the CPOE arena — rather than helping to solve today's problems.

Timing of CPOE implementation

In our view, based on a realistic evaluation of the state of readiness of systems available to serve CPOE needs — and the condition of current work processes serving patients — CPOE has emerged as a high priority too quickly. The momentum created by Leapfrog runs a high risk of exacerbating the problems Leapfrog is trying to correct. So if Leapfrog and others take a deeper look at the problem, they may modify their recommendations to the industry to create a more effective movement toward better next steps to reduce the error-prone work processes that now exist.

If Leapfrog does not change its position, what should you do as a hospital leader? It depends on how important Leapfrog is to you, your board, and the financing of patient care in your community. If it is important, you will need to find some logical way to address Leapfrog requirements and have a successful implementation of a CPOE system.

However, if Leapfrog is not important, the CPOE priority should be deferred until early adopters demonstrate greater success. In any event, you should proceed with caution. ■

Mr. Dorenfest is president of Sheldon I. Dorenfest & Associates, Ltd., a Chicago-based consulting firm and a leading source of information and analytical services for the health care IT industry.