

Photo by Dan Dry



# Phoenix

MR#	Sex	DOB
6000059	F	9/20/

CULTURE, CF P

Received Date and Time	Received Date and Time
11/18/2005 4:00 PM	11/18/2005 4:00 PM



Specimen Description  
SPUTUM

Special Requirements  
None

Culture:  
Many possible

A five-year, \$70 million computer-system upgrade will overhaul the way patient information is processed at the University of Chicago Hospitals.

# takes flight

by Corinne Low

The Phoenix Project could be as aptly named as any initiative ever undertaken at the University of Chicago Hospitals: It is literally a rebirth for the medical center's aging computer systems.

Scheduled for completion in 2009, the five-year, \$70 million effort is more than a mammoth upgrade of both hardware and software; it will overhaul the way UCH processes information, especially patient medical information.

Date/Time	Test
11/21/2005 11:36 AM	NEONATE TESTING
11/21/2005 11:01 AM	NEONATE TESTING
11/20/2005 10:00 AM	CANNABINODS, UR
11/18/2005 4:00 PM	CULTURE, URINE
11/18/2005 4:00 PM	CULTURE, BLOOD (BACTERIAL & FUNGUS)
11/18/2005 4:00 PM	CULTURE, CF RESPIRATORY
11/18/2005 10:43 AM	CHLAM/IGC AMP PROBE
11/18/2005 10:42 AM	CHLAM/IGC AMP PROBE
11/18/2005 10:42 AM	CHLAM/IGC AMP PROBE
11/17/2005 8:00 AM	CREATININE, SERUM (CCLR)
11/17/2005 2:00 AM	ENDOMYSIAL IGA, AB
11/17/2005 2:00 AM	GLIADIN IGA, AB
11/17/2005 2:00 AM	GLIADIN IGG, AB
11/17/2005 2:00 AM	TISSUE TRANSGLUTAMINASE IGA, ANTIBODY
11/17/2005 1:00 AM	ENDOMYSIAL IGA, AB
11/17/2005 1:00 AM	GLIADIN IGA, AB
11/17/2005 1:00 AM	GLIADIN IGG, AB
11/17/2005 1:00 AM	TISSUE TRANSGLUTAMINASE IGA, ANT
11/17/2005 1:00 AM	WEST NILE IGG & IGM
11/17/2005 1:00 AM	WEST NILE IGG & IGM, AB, CSF
11/16/2005 4:00 PM	CULTURE, BLOOD (BACTER



“This is the only project of this magnitude that we did not justify based on return on investment,” said Jeffrey Finesilver, UCH vice president and director of the Duchossois Center for Advanced Medicine. “We did not justify this based on recouping malpractice costs or budgetary returns. This is a quality-of-care, patient-safety initiative.”

Central to the project is software from Madison, Wis.-based Epic Systems Corp., which specializes in medical information systems. The software will integrate patient data from a variety of sources and make it available instantly to those involved in a specific patient’s care. Instead of having to write paper orders, doctors will enter them in the new system and receive the results in the software’s secure “inbox” accessible from any workstation. Among the benefits are:

- Online medical records will increase collaboration among clinicians and eliminate the need to re-enter data on returning patients.
- Computerized test and medication orders will make care safer and more efficient by reducing human error.
- A “clinical decision support system” will offer suggestions to reduce duplications and incompatible medications, and provide reminders for regular exams and testing, as well as other support rules determined by the medical staff.

“In the intensive care units right now, a certain amount of nurses’ time is spent documenting vital signs—blood pressure, pulse, temperature,” said Nancy Caligiuri, a registered nurse and a member of the project’s sponsor group. “Over time, we plan to integrate medical devices so that information will automatically be captured from the machines and entered into the [patient’s] medical record. So the nurses’ time can be spent critically analyzing what that data means, rather than [doing] data entry.”

Alex Lickerman, AB ’88, MD ’92, the physician sponsor of the project, expects the new system to increase safety because when “one doctor makes a change in the [patient] database, every other doctor can see it.” Currently, a patient who is seen in several clinics at the Hospitals can have different records at each—a situation that can produce dangerous results. A doctor risks prescribing medication that has a harmful interaction with a drug the patient is already taking, Lickerman said, or, in extreme cases, “a doctor can provide the same medication and the same dose as a doctor in a different clinic and the patient doesn’t even realize [he’s] taking double the amount.”

In the new system, automated flags can signal concerns about a prescription or test and prompt the physician to resolve the issue immediately. Computerized entry of care instructions also may curb errors stemming from misinterpreted written or verbal orders.

The Institute of Medicine estimates that 7,000 people die annually from such errors. Handwriting quirks that make a “μ” for micrograms look like an “m” for milligrams can spell the difference between a cure and a death sentence. Sound-alike drugs ordered verbally without an accompanying description of the medication’s purpose could result in an epileptic receiving the anti-fungal drug Lamisil instead of the anti-seizure drug Lamictal.

### A long time coming

Chicago is not on the crest of this technology wave—and ironically that may prove to be a benefit. High-profile problems in computer upgrades at the University of Pennsylvania hospital system and Cedars-Sinai Hospital in Los Angeles have led to significant advances in software. Organizations such as the Brigham and Women’s Hospital in Boston have worked for many years on these types of systems and now are documenting improvements in safety and quality. Chicago also has taken special care with the Phoenix Project to make certain that all stakeholders in the system provided plenty of input into its design.

**Automatic data entry from medical devices that read vital signs—like blood pressure, pulse and temperature—will enable nurses to spend more time with patients and less time entering data.**



**The Phoenix Project's new software system will integrate patient data from a variety of sources, providing clinicians access to information in a secure "inbox."**

The Institute for Safe Medication Practices made a "Call to Action" in 2001 that proposed elimination of handwritten prescriptions in favor of computerized systems by 2003. But in March 2005, more than two years past that deadline, a study published in the *Journal of the American Medical Association* reported Penn's system had 22 types of errors that were exacerbated by the hospital's newly installed computer system.

Critics quickly pointed out that the study only looked at one system, now outdated, and dealt more in clinicians' impressions of how the system helped or hurt their care rather than actual adverse events. Nonetheless, the study's message resonated with those who see new computer systems as a quick fix that too often brings problems of its own.

"The potential that everyone talks about with these systems is to make the process of treating patients more consistent, easier and less likely to have problems," said Richard Cook, MD, associate professor of anesthesia and critical care. Cook also directs the Cognitive Technologies Laboratory, which studies the way humans interact with technology.

## Do we still need doctors?

**What may seem like a rhetorical question—and a provocative one at that—actually may stimulate a range of discussions in this technological age. And the answers may surprise you.**

"The question is, 'How individualized ought medicine be?'" said John Lantos, MD, professor of pediatrics at the University of Chicago and author of the book *Do We Still Need Doctors?*

In his book, Lantos weighs the conventional wisdom that physicians are essential to clinical care against the growing body of support that evidence-based practices save more lives than individualized care based upon clinical judgment.

"Doctors tend to view their professional expertise as [irreplaceable]; we think we're better than computers," Lantos said. "But a lot of the evidence shows that we're just wrong, and in a lot of cases, computers are better than humans. People who follow algorithms, who follow rules, get better results than people who make case-by-case judgments as to what they should do."

Lantos' argument is particularly relevant to the University of Chicago Hospitals as it invests in a \$70 million information technology project (see main story on page 26) that will, in part, feature computer software alerts with evidence-based treatment recommendations.

Lantos maintains that in situations where there are proven methods of care where there aren't likely to be surprises along the way—doctors are pretty much auxiliary.

"My favorite example is the polio vaccine," he said. "I think a grocery store clerk could give it just as well as a certified pediatrician, and it would work just as well."

At the other end of the spectrum, he said, are complex chronic diseases such as rheumatoid arthritis or diabetes, where the scientific basis of disease and therapy are not well understood, so the treatments are complex and don't work very well.

"You need doctors most when medicine works least," he said. When it comes to complex, difficult-to-treat diseases, computer algorithms won't be as useful because there simply is no right answer. "The science is imperfect."

Does this mean doctors will be eliminated in all but the most extreme cases? Not likely, he said. Even if physicians themselves accept a diminished role for doctors in certain clinical situations, patients might not.

"It's not that doctors are better at making clinical decisions," Lantos said, "but it is that doctors are—or should be—better at taking care of human beings."

Besides, he said, there are rare instances where a doctor's judgment really is better—where experience trumps evidence. And most of the new breed of hospital computer systems, including the one Chicago will install, allow doctors to override suggestions easily.

"The solution is an incremental introduction of voluntary computer algorithms that allow doctors to maintain their independence and authority while using the computer as a tool to improve their decision-making," Lantos said. "As we work with such systems, we'll find the best balance."

"It's kind of like the computers that land jet planes," he said. "Most of the time they're better than pilots, but no one has fired the pilots yet."

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Photo by Dan Dry

**Representatives from all the groups that will use the new computer system took part in meetings to provide ideas and recommendations on its design and implementation.**

“The difficulty in making such systems work really well in a clinical environment is to make them effective ‘team players’ with the people working in this environment,” he said. “In an effort to prevent ‘error,’ the system often becomes a smaller, tighter box in which the user must work.”

Project sponsors at Chicago, though, expressed confidence that careful planning and a high degree of clinician involvement can solve the problems that plagued Penn and Cedars-Sinai.

“All of the detailed decisions are best made by the people who will actually be using the technology,” said Jonathan Silverstein, MD, director of clinical informatics at Chicago.

Silverstein said that many of the problems with the earlier systems either have been addressed in planning for the UCH implementation or have been eliminated by Epic. Some glitches cited in the *JAMA* study, such as preset values for medication dosages coming in terms of pill size rather than recommended prescription, have been rectified in the new round of software, he added. Therefore, University of Chicago’s late-to-the-game installation may work to its favor.

Silverstein himself came from an installation considered successful—University of Illinois Medical Center at Chicago—but said there still is room for improvement. In particular, he said, the logic the system uses to determine suggested doses for medication, when to issue warnings and how to allow system overrides must be extremely sophisticated.

“The interaction with the system has to be to [the user’s] benefit,” he said. “You want alarms and alerts that come on at appropriate and useful times.”

But most of all, Silverstein and his colleagues in the sponsor group said they think their biggest asset in the project is support from the medical community.

“I’m hearing from the clinical leadership saying, ‘What can we do to get this thing in faster?’ I’m hearing from the residents, ‘What can we do to help the process of implementing it?’ I’m hearing from directors of residency programs saying, ‘We’re excited about this; we’re going to use it as a recruitment tool,’” Silverstein said.

This sort of energy will be necessary on a continuing basis if the group decides to move forward with a full-blown decision support system, he said. “One can’t magically guess the consensus of our physicians or grab it from a Web site somewhere; it requires the assertion of our staff that this is how we’re going to treat this particular illness,” Silverstein said. “We need endocrinologists telling us what the best practices are for their field; we need cardiologists telling us about their field.”

### **Widespread support**

Such best practices are not static, but constantly evolving. To keep the system current requires a large team of committed experts dedicated to the latest medical knowledge. “The Phoenix Project isn’t what creates that,” Silverstein said. “What creates that is the ongoing energy and support of our institution.”

Support for improvement in health care information systems is widespread—even beyond the university. Several bills have been proposed at the state and federal levels to offer funding for new technology in physician practices and hospitals.

“In our lifetimes, we’ve seen some of the greatest advances in the history of technology and the sharing of information,” Sen. Barack Obama (D-Ill.) told graduating Chicago medical and biological sciences students this past May. “Yet you’re about to enter a profession where too much care is still provided with pen and paper, where too much information about patients isn’t shared between doctors or readily available to them in the first place, and where we still don’t have the information to know what care has worked most effectively and efficiently to make patients healthy.”

