NURSING INFORMATICS: TRACKING TECHNOLOGY ADVANCES

Four experts in the field of nursing informatics gathered recently at the HealthLeaders headquarters in Nashville, Tenn., for a Roundtable discussion focused on the issues hospitals face when merging information technology with nursing.

ROUNDTABLE HIGHLIGHTS RT3

- How do U.S. hospitals score in terms of involving nurses in information technology decisions?
- Common mistakes made by hospital leaders when integrating a new IT system into the workflow of the nursing staff.
- Thoughts on whether health systems or hospitals should have a chief nursing information officer in place, and where that position fits into the executive team hierarchy.
- Strategies for getting nursing technology needs on the front burner in terms of hospital spending priorities.

KEY QUESTIONS ANSWERED RT7

- What are other areas of technology—aside from CPOE and eMAR systems—that should be given attention in the nursing arena?
- What technology solutions have the potential to save time for nurses?

FURTHER READING RT9

- A Roundtable participant details how Bayshore Medical Center in Pasadena, Texas, got its eMAR system up and running.
- How Wake Forest University Baptist Medical Center uses a team of nursing informatics specialists to implement a new order-entry system.

Panelist Profiles

GARY BALDWIN (MODERATOR) is technology editor with HealthLeaders, where he contributes numerous articles on industry IT trends and oversees the magazine’s technology coverage. Baldwin’s expertise is drawn from a long career covering the technology side of healthcare at various industry trade publications. Based in Chicago, Baldwin also spent four years as director of communications with the Chicago Medical Society in the mid-1990s.

CAROL BICKFORD, PH.D., R.N., B.C., is senior policy fellow in the Department of Nursing Practice and Policy at the American Nurses Association. Bickford is a retired Navy Nurse Corps officer with more than 30 years’ experience in diverse nursing positions, including serving as project officer for the installation of two hospital information systems in an acute-care military facility. She serves on the faculty of the Weekend Immersion in Nursing Informatics. Bickford has received awards from the Maryland Nurses Association, Sigma Theta Tau International and Healthcare Information Management Systems Society.

RENE HARRIGAN, R.N., is director IT&S and communications at Bayshore Medical Center in Pasadena, Texas. She began her career as a nurse focusing on ER and critical care. Harrigan has worked for HCA Inc. for 17 years, including as nursing director for three med/surg units. In 1994, she co-coordinated the installation of Meditech at Clear Lake Regional Medical Center in Webster, Texas, and since then has supported and installed the technology at two more facilities. She has worked on the Nursing Task Force for HCA to improve systems for nursing documentation.

JUDY MURPHY, R.N., is director of application development at Aurora Health Care in Milwaukee, a 14-hospital integrated delivery network. She is responsible for the application software and computer systems that support all departments in all Aurora affiliates, including nursing, physicians, lab, pharmacy and radiology. Murphy is a member of HIMSS and the American Medical Informatics Association, and serves on the AMIA Board of Directors.

NANCY STAGGERS, PH.D., R.N., FAAN, is associate professor, clinical informatics, at the University of Utah Health Sciences Center. She has led efforts ranging from creating visions for computer-based patient records and designing applications to implementing and evaluating systems. Staggers focused her research on clinical application usability. When this Roundtable was completed, she was associate chief information officer at the University of Utah, leading large clinical systems projects.

THE NEXT ROUNDTABLE

Topic: Managing and Maximizing: Service Lines to Bottom Lines

The next HealthLeaders Roundtable panel will look at practical solutions for maximizing revenue from a handful of hospital service lines. If you are interested in participating as a panelist, contact HealthLeaders.com Editor Jim Molpus at jim.molpus@healthleaders.com.
Roundtable Highlights

IT Decision Making

GARY BALDWIN (Technology editor, HEALTHLEADERS magazine, Moderator): How would you rate the job that the U.S. healthcare system and U.S. hospitals are doing in terms of involving nurses in information technology decision making?

JUDY MURPHY, R.N. (Director of application development, Aurora Health Care): I'd say a B-plus. I think we're in a completely different situation than we were 10 or 15 years ago. I've been doing this for 20 years, and when I started, it was a bit more of a struggle. There was a lot of attention paid to the financial systems and the clinical side was just really getting started. Over the years, the clinical side has gotten to be much more mainstream, and as a result, nurses have been not only involved in the clinical side but also getting into the registration and scheduling, the physician things.

RENE HARRIGAN, R.N. (Director IT & S and communications, Bayshore Medical Center): I think we're a B-plus as well. Our facility has always believed you get a better utilization out of the project if you involve the nurses from day one, and have them help build the project, and then they have better buy-in. The more you allow that, and the more you build the education piece around it, the better response you get from the staff.

CAROL BICKFORD, Ph.D., R.N. (Senior policy fellow, American Nurses Association): I would say that there's some leveling; that we probably have the B-plus at the larger acute-care facilities and larger networks where they have financial investments and information technology has been the mainstream initiative. But in smaller community facilities, we're probably no higher than a C. We're dealing with a different level of information systems support. The nursing staff is struggling to maintain the patient-care initiatives and doesn't have the expertise of the informatics nurse component. We also see a different level of nurse administrator. I'm not saying that they're less than qualified—they just have a different focus at that point. Nurse administrators are key in the decision making for IT purchases, and probably have a seat at the table at the larger facilities, but I would say that at the smaller community spaces the decisions are mostly made around them.

NANCY STAGGERS, PH.D., R.N. (Associate chief information officer, University of Utah Health Sciences Center): Nurse executives and the physician leaders have awakened to the fact that nurses are at the interface between the patient, the computer, and care, so that you cannot install computer technology any longer in an acute-care setting without considering that.

STAGGERS: Some of it is a time limitation for the physicians—it's not that nurses don't have time limitations—but for the physicians because of their long days, if you don't have technology that actually helps them save time or make them more productive, then they don't use it altogether.

Learning from Mistakes

BALDWIN: What are some of the common mistakes that hospital leaders make when they are implementing new IT systems, in terms of how that system impacts the nursing staff?

HARRIGAN: There's not a team effort to put the piece together and pull all the people that would be the end users of the system and look at what their day-to-day process or their work flow is.

STAGGERS: I see the lack of integration of applications, usability, usability testing and user-center design as a near-fatal flaw in most vendors today. While they are beginning to integrate usability into their design processes, it's new in healthcare. It's not new in, say, Microsoft and other entities, but in healthcare, that's new. Selection teams need to have as one of their main factors usability components of software.

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MURPHY: When you’re first starting out, it’s ownership. A lot of the projects that we get involved with, which are big projects, like multidisciplinary documentation for nursing and all-discipline CPOE, these kinds of things are top-down initiatives. Somebody decides this is a really good idea, and it is, and there are all sorts of good quality reasons why you want to do it. So then you go out and you search for champions. Step one in many of these projects is talking to the administrators and talking to the physicians and the nurse leaders to make sure there’s buy-in. We don’t always spend enough time in that phase.

BICKFORD: One thing that we’ve found in our environment was the failure to plan for the ongoing, expensive processes. Training just doesn’t happen by itself, and there are resources that have to be in place, including a separate training database. There are certain investment costs that have to be ongoing and they’re never going to go away. The investment is a continual process. Part of the problem is also that we don’t have a clear understanding of what our healthcare business is, and putting in an information system is a significant change in an environment to begin with.

The Role of the Chief Nursing Information Officer

BALDWIN: How important is it for health systems or hospitals to have a chief nursing information officer in place? Where should that position be placed in the hospital executive-team hierarchy?

STAGGERS: Certainly all of us would be supportive of such a role. But I would look at exactly where that person would be placed in the organization so they can be most influential. If they’re relegated only to work with nurses, I think their impact is much less than if they worked, say, for someone who was over patient services or even in the IT department. Then your span of influence is much broader. Clearly, the CNIO could be well placed working for the CIO, or be the CIO, more preferably; or working in conjunction with either patient care services or right under the top level, at the very least.

BALDWIN: If a hospital or system CEO wants to create the CNIO position or hire a new one, what should the CNIO’s qualifications and background be?

MURPHY: It starts with a solid clinical background. There are some nurses who go straight out of nursing school into an informatics program and that probably isn’t the ideal scenario. A solid clinical background may include some managerial accountability.

STAGGERS: It’s crucial, too, in this day and age to have formal education in either informatics or IT or computer science. In the past, many people have bootstrapped themselves into positions and been exceptionally successful, but as we move forward, with the complexity of the IT systems and what you need to know about standardized taxonomies, a formal education is very helpful. The clinical piece is that centerpiece. Then the IT piece you absolutely must have. But I think also you need the whole executive piece—how to be a leader—whether that’s through formal education or whether you rise through the ranks.

BALDWIN: We’ve been talking about the ideal candidate for a CNIO. In reality, how would you assess the available pool of candidates with these qualifications?

STAGGERS: Those of us who are nurses in IT are fairly scarce to begin with. And as the baby boomer generation ages, some of us are reaching more strategic levels.

MURPHY: There are a lot of nurses going into IT but I also think they’re more at the staff level today and interested in many cases in staying at that staff level. Often people who go through a master’s or Ph.D. preparation in informatics are interested in doing research or being in academia. I think there is a pool of people out there, but they’re more on the foundation side or the science side, as compared to the applied or the practicing side.

Making Technology a Priority

BALDWIN: When hospital decision makers are deciding which new capital projects to fund, how can you convince them that the tools you need are just as important as new patient care technology?

HARRIGAN: It’s challenging because when you go to the IT budget, you go to your administrative staff and
say, “I need $165,000 to do this,” and they’ll say, “But why?” “Well,” I say, “nurses need to have accessibility, and I need physicians to have accessibility.” Then they ask, “What’s this going to do and what’s my return on investment?” You’ve got to be able to support that piece so they understand how integral it is, or it’s going to be very challenging for them to go to their corporation and say I need this dollar amount.

**MURPHY:** The return on investment on these is elusive. It’s not like you install it today and a nurse who spent two hours in documentation in a paper world now will only spend an hour, and now we have a very specific hour that we can direct toward patient care. We’re finding with documentation systems, for example, that it’s typically not faster to do it on the computer. Once it’s in the computer, though, you’ve got any time/anywhere access; you’ve got the ability to pull the reports and the ability to do decision support, so there’s all sorts of quality-related issues involved. But no, you don’t get that kind of return on investment. It’s difficult to get the buy-in up front when the capital expenditures that you’re up against are the new MRI machine. So the argument has to be you’re in it for the long haul, you’re looking at where you’re going and what you are going to be able to do in the future. And that’s the hard sell.

**IT Hot Spots**

**BALDWIN:** What areas of nursing clinical practice do you feel are most ripe for IT involvement? With so many options and products right now, what do nurses on the job right now need the most in terms of how technology can improve their practice in areas like patient safety?

**STAGGERS:** Nurses are at the centerpiece of patient care. Computerized orders would be integral. I would add integrated progress notes so they can easily pull up information across the team members and be able to see it. A hot topic right now is bar-coding medications. That’s okay as long as it’s integrated in with some of the other IT efforts and not as a standalone application.

**HARRIGAN:** The computerized physician order entry, because of the delay and difficulty in handwriting and determination, that’s your patient safety issue. You’ve got your most common abbreviations, and the ones that are nonusable abbreviations because that interpretation can hamper your patient safety and so if you have a physician order entry, then it’s very clear cut from that piece of it.

**MURPHY:** Good, clean allergy information, good, clean advance directives information—the basic stuff—but it’s stuff that we usually have to rely on paper for. If we knew that we had that information in the computer and it was accurate from across the continuum, if that was collected five hospital visits ago, we’d have access to that information.

**BICKFORD:** I would say that this is a solution that’s tangible. If the IOM came out and said our business processes in healthcare are so messed up that we’re bound to fail and we can’t do anything better and we’re killing hundreds of people—and that the only solution is total business-process redesign—they’d be laughed out of the country. But this is a solution that’s tangible, and in conjunction with that there is some business-process redesign that has to occur and there are some critical things that have to occur. So it’s something you can touch and help be part of the fix.

**BALDWIN:** What are going to be some of the key informatics issues that we should be considering in the near future?

**STAGGERS:** I think one point and perhaps one that we haven’t addressed is users’ expectations about what is possible and what’s visionary, like the computer-based patient record, and what’s “really” reality and the gap in between. The IOM recently talked about having all notes in computers by 2010. Is that realistic? Have we bitten off more than we can chew? Maybe we should look at something more realistic, like just having essential data shared; medications, allergies, problems, those kinds of things, rather than the be-all and the end-all of computerization.
Key Questions Answered

The Roundtable panel discusses current nursing technology initiatives beyond CPOE and the electronic medication administration record.

Q: What are other areas of technology—aside from CPOE and eMAR systems—that we need to give some attention to in the nursing arena?

Bickford: We have many nurse entities, home health nurse groups and so on, looking at technology solutions to increase their patient load in less time, so they’re using telehealth initiatives. And we see innovative solutions where the nurses are taking a lead in helping put this technology in place, oftentimes linked with an acute-care facility or a community hospital, but still that’s an outreach initiative that we’re not necessarily paying particular attention to.

Q: It has been said that many of the clinical information systems that nurses use do not amount to a net savings in time. Are there some technologies that do have the potential to save time for nurses in other areas?

Bickford: An example of a solution that can help reduce some of that work is automated scheduling systems that are now becoming more prevalent where I, as a nurse, can dial in on the Web and put in my preferences for my schedule and it’s being done with decision support, actual software applications to make it so that the nurse administrator doesn’t have to sit there with a ledger and figure out, “I’ve got to fill this block, I’ve got this many nurses.” We spend an inordinate amount of time doing the paper-based scheduling process and putting it up on the board—and then it could get totally destroyed because something happened you didn’t know about. With an automated scheduling module, some of that’s taken care of.

Q: With so many forms and so many regulatory requirements, how do you sort it all out in a logical way?

Harrigan: There are now more areas that require documentation. The Joint Commission says we need to have these things so we have to add that to the system. Sometimes we’ve found that we keep wanting to add so much stuff to the system so we can meet all the federal regulations and the Joint Commission regulations that we forget about the person that’s using the system. The whole [HCA] Houston division is doing what we call “thorough standards-based documentation” in which we’re trying to simplify that piece and standardize it for those 10 hospitals in Houston and quit focusing on what Joint Commission requires, what Medicare requires, what the state requires, what HIPAA requires, what you have to require for your patient care standards, and think about the end user instead, because those are the ones who are taking care of the patients.

Q: Nursing has become a popular second career choice for many. How do you see their potential on nursing informatics?

Bickford: It will be very interesting to see the results of the sample survey of RNs, because we’re seeing increasing numbers of individuals coming into nursing as a second or third career, which means that we have policemen, we have financial people, we have teachers, we have business executives moving across to become healthcare workers in nursing. So it will be interesting to see how those nurses adjust our age, as well as our experience base, and also what effect these newcomers will have in helping us move some of the information technology forward. It’s still a small number but it’s refreshing to have different eyes come in sometimes.

Q: What are you hearing from the nurses out there about HIPAA, if anything?

Murphy: There was a perception, going back to your patient care question, that people who needed information to make decisions about care would not be allowed to get that information because of HIPAA. And that’s just wrong and I think we’ve dispelled that with the education. It doesn’t mean that it doesn’t crop up. I think as long as you have an officer who is solid in understanding how it’s really supposed to be executed and you’ve got some things like a privacy line where anybody and everybody can call anonymously and ask questions about what they can and cannot do, I think you’ve got everything in place to do it right.

—JIM MOLPUS
Further Reading: Bayshore Medical Center

In June 2003, 372-bed Bayshore Medical Center in Pasadena, Texas, began a rollout of its electronic medication administration record system. It was the 26th hospital in the HCA Inc., chain to install eMAR. The rollout began with a 41-bed medical unit, and will continue with more medical units and then critical care units early in 2004. Rene Harrigan, R.N., Bayshore Director IT&S and Communications, discusses implementation:

Q: How did Bayshore get started on eMAR?

Harrigan: This is an HCA initiative that started last year. We have 58 hospitals that are implemented at this point. Everything is bar coded, including your patient who has a bar-coded armband. Every medication is bar coded and integrated into our clinical information systems that pull all of those pieces together to make sure that this is the right patient, the right drug, the right time, the right dose, the right route, and does all those right things.

HCA has taken that initiative to roll this out as a patient safety initiative. They are providing us all of the equipment; they provide us online training for all of our staff and then we actually can do the one-on-one training. They have practice sessions so they actually have practice barcode medications; they have practice patients so that they do that competency piece before it’s actually implemented on the different nursing units.

Q: Could you be more specific on how the training works? What does the staff actually do?

Harrigan: The nurse goes to the computer, it has the entire program, and the nurse signs on. Nurses have their sheet that has the bar code right there, that they practice with through the whole piece. They can take different sections over again if they don’t feel comfortable.

Nurses also have a clinician or an IT educator who is there with them for their initial training to help them do the actual work flow process—the actual demonstration prior to going full implementation on a nursing unit.

Q: Did you have any integration problems as you collected the data or the data standards to feed into your clinical information system?

Harrigan: It was very minimal because we’re already an integrated system. The biggest piece was the bar coding of all the medications by the pharmacy department. Because most of your pharmacy implementations are not bar coded. We have a robot that actually dispenses all of our bar codes, all of our medications, and pulls the medications based on the patient’s pharmacy profile.

Your biggest piece is implementing what tools your nurses are going to use on the nursing units to utilize the eMAR. Before, they had their little notebooks that had all of their medication administration records they pulled together; they had their nurse servers or they had an Accudose, which is where they store their medications or their IVs. They pulled those pieces and they’d go down the hall. And if you have large units, that can be kind of cumbersome.

But now all they take with them is their mobile cart. And they have their nurse servers with their medications outside the patient’s room, so they go directly from their nursing station to the patient’s room, and their eMAR is actually electronic, and they just pull it into the patient’s room. They’re actually doing it in the patient’s room rather than down the hall and doing their checking prior to that.

Q: If you had anything to do differently the second time around, what would it be?

Harrigan: We probably would have extended our support a little bit longer. We did a full two weeks of support with 24 hours basically for the first week, but you have such a change and with staffing issues as they are today—nurses float from department to department, and it’s very difficult. We started with one unit. And it’s very difficult to have just one unit, because then the other nurses say, “Well, we can’t go to that unit, because they’re on electronic and I’m on paper.”

I also probably would have implemented larger groups at one time rather than just one particular unit so that you can have that flexibility and support for that particular unit.

Q: The devices themselves, they are a cart with a laptop on it? And they are wireless?

Harrigan: Correct, except in our critical-care areas, and there are wireless scanners that we actually have not implemented in our neonatal units or critical-care units, just med/surg.

Q: You had a road map of sorts based on HCA’s experience, didn’t you?

Harrigan: HCA gave us a six-month time frame. We had task lists that we needed to do and it was not just an IT project; nursing was involved, there were nursing managers and staff nurses in on the planning. There were pharmacists, there were pharmacy directors, and there were pharmacy techs. HCA was very diligent when they did their pilot units to come up with best practices. —JIM MOLPUS
Wake Forest Case Study

Last November, North Carolina Baptist Hospital, part of Wake Forest University Baptist Medical Center, started implementation of a new patient-tracking system in the academic medical center’s emergency department. The nursing staff played a critical role in the ultimate success of the project.

Implementing a new component of an integrated clinical information system is nothing new at the 830-bed Winston-Salem, N.C., medical center, which has been moving steadily away from paper-based record systems since 1995.

Steve Davis, R.N., is one of 12 full-time nursing information systems specialists at Wake Forest who make up the Nursing Information Systems department. All NIS members are registered nurses who have transitioned into roles as educators or liaisons between the clinical staff and the IT staff.

For this project, the first step of the implementation involved getting ED managers and staff nurses together with clinical systems team members to tailor the patient-tracking system. The goal: to coordinate the new system with daily ED work flow.

“We would do an integration testing series where we would invite staff from the ED to come down and play with it,” Davis says. “They would give us direct input on what they wanted to see changed. Up until the day before we started training, we were still making changes to it at their request.”

Wake Forest has had great success with such a collaborative process in its most recent series of IT implementations. But how well the ED nursing staff reacted once the implementation went live surprised even Davis. “Once we did the training and got it up, we had staff on the unit on the day of implementation of a change tell us they liked the system,” he says. “It is very uncommon for nurses to say they like change.”

Another component of the technological integration at the medical center, the EMR development process, began with an order-entry system where physicians wrote paper orders that were then entered into a central system by unit secretaries, says Mary Ann Anderson, R.N., director of nursing, clinical systems. A “homegrown results reporting system” had allowed nurses, physicians and other caregivers to view lab results and parts of the medical record online, she says. But nurses and social workers were stuck doing all of the data entry, and physicians were only passive users of the system.

In November 2002, Wake Forest physicians began using the CPOE implementation built on the IDX LastWord system to place orders. The team of nursing informatics specialists has learned some key approaches to integrating the system with the work flow of the hospital’s nearly 1,500 registered nurses.

One problem with getting the nursing staff to buy in to any new clinical information system, whether it be a patient assessment or the medication record component, is in managing expectations about changes to the nursing work flow. One common misconception, Davis says, is that many nurses expect that any new system has been designed to save them time when, in fact, that is not necessarily a planned outcome. It may help to explain that, at its most basic level, the computer is simply a “central documenting system,” he says. So while in some cases, even though it may take nurses fractionally longer to enter patient assessments on a computer than it may have on paper, that data is now instantly visible to other people in the treatment chain.

In addition to new projects, Wake Forest keeps steady lines of communication with the floor nurses on needed ongoing improvements. The assessment of the system includes such practical concerns as whether bedside computers, laptops or PDAs work better for particular tasks. The hospital has found success using a wireless system, with laptops on medication carts, Anderson says.

From the first and second quarter of 2002 to the same quarters in 2003, the number of adverse drug events in the first unit to go live on CPOE dropped 35 percent, according to IDX. Even based on anecdotal information, Anderson says there also have been fewer errors with handwriting translation from both physicians and pharmacists.

Improvements even translate into something as simple as speeding up the time it takes for a patient to get medicine from the nurse. Valerie Vestal, R.N., a nursing information systems educator, says medication orders previously were recorded on paper and then went through two entities before reaching the pharmacy. “Now the order goes directly to the pharmacy, where it is checked and validated,” Vestal says. “The nurse can retrieve the medication on the unit using one of our dispensing machines.”

—JIM MOLPUS