SCOTTSDALE INSTITUTE

INFORMATION EDGE

The Nursing Shortage: High-Tech Means Higher Touch

Executive Summary

The nursing shortage is a critical issue for healthcare executives that defies simple analysis or easy solutions. And it's only getting worse. From just about any statistical vantage point, the crisis is growing. By 2010, there will be a 20 percent shortage of nurses[i]; by 2020, only 640,000 nurses will be available to fill 1.8 million spots.[ii] All this while the pool of pharmacists, therapists and technicians is also shrinking. The national average vacancy rate for nurses is 11 percent, three points above what's considered a shortage.[iii]

This Information Edge report takes a look at the roots of the nursing shortage and explores how technology—in addition to supply issues like recruitment and retention—can help make nursing more productive and effective and thereby free up nurses' time to do what they do best: care for patients. Focusing on technology and processes to improve nursing productivity inevitably raises the issue of quality and patient safety. Ultimately, the two are inseparable, because more efficient and effective nursing means better quality of care.

We also explore how two integrated delivery systems—Ascension Health in St. Louis and UPMC Health System in Pittsburgh—are addressing the shortage, including a look at an innovative application of industrial principles to clinical settings that holds promise for improved efficiency and quality of care. Finally we conclude with suggested steps using technology to improve nursing productivity.

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More stress, fewer nurses

The implications of the nursing shortage are real. The shortage is most common in areas such as intensive care or emergency, which require experienced, highly skilled nurses. More than half of nurses say that at least half the errors they report result from inadequate staffing. One study found that a potential 3 percent to 12 percent reduction in preventable complications could be achieved with higher RN staff levels.[iv]

Many nurses are leaving direct care; the most common reason given is a desire for a less stressful and physically demanding job.[v] As the population goes, so too the nursing workforce. Between 1983 and 1998, the average age of RNs increased by 4.5 years. By 2010, more than 40 percent of RNs will be over 50.[vi]

Despite the need, the industry is not attracting new nurses. Enrollment in entry-level bachelor's degree programs declined last year for the sixth consecutive year,[vii] and the number of new nursing licensees declined 16 percent during the past two years.[viii] Meanwhile, as Baby Boomers age, the demand for nursing skills will increase. Between 2010 and 2030, the number of people over the age of 65 will increase by 13 percent, or 30 million. By 2030, 8 million people will be between the ages of 70 and 90.[ix]

Unfortunately, most healthcare delivery organizations have been concentrating almost exclusively on trying to attract and retain nurses, rather than seeking to find new ways of applying technology to mitigate the inevitable impacts of the reduction in nursing supply and increasing impacts of new medical technologies.

"The focus on supply alone is not going to cut it," says Luther Nussbaum, chairman and CEO of First Consulting Group. "Eighty percent of all qualified nurses are already employed. This idea that there are nurses waiting in the wings to be drawn back into the profession just isn't true," he says, adding that increased state funding to attract more nursing students isn't a total solution either. Many three-year schools have closed in the last 10 years and the remaining schools lack teachers. "We didn't plan for the increasing demand from an aging population versus current and future supplies. It's a dramatic problem that's only going to get worse."

And even when it comes to applying technology to the problem, most organizations are missing the key opportunity, Nussbaum argues. "People are looking at technology to make nursing more attractive and to retain nurses. We should also look at it to reduce demand for nursing time." That becomes increasingly clear when nursing workflow is examined.

Repeatedly questioned
Documentation activities consume huge amounts of nurses' time. The industry estimates that nurses spend 40 percent to 50 percent of their time on clinical documentation. Patients are asked the same questions repeatedly. There's a lot of confusion about what documentation is really required. Many physicians say they do not read the nurses' documentation and the JCAHO says they never asked for about two-thirds of what nurses do document.

Robert A. Greenes, M.D., PhD., is a professor in the joint Harvard/MIT division of Health Sciences and Technology and head of an R&D team at Brigham & Women's Hospital in Boston, part of Scottsdale Institute member Partners Healthcare System. He agrees that one of the issues for nurses is the amount of time spent on charting. Greenes believes that the problem could be alleviated through use of "smart" high-tech devices. These portable, electronic devices

could automate charting, incorporate clinical protocols and provide a proactive identification process for the patient, caregiver and treatment.

For example, wrist bracelets could identify patients using a wireless signal and a bar code when in a one-foot proximity of the patient. They would also identify any procedure or medication for the patient.

Unit dose packaging should be scannable when administered. Syringes could also be packaged for unit dose, and scanned. Medications added to IV drips should also be scannable, the drip rate and amount monitored electronically, and administered dose calculated continuously. Clinical guidelines or protocols could be incorporated in a handheld or portable device, allowing the nurse to read what steps he or she should take. The system could confirm the correct patient, procedure or medication to be administered.

"Besides saving time, positive confirmations of patients, procedures and medications would take a lot of drudgery out of recording data and eliminate the tension of making mistakes," says Greenes.

'Strapped for time'

In a non-technology approach already used by some specialties, non-physicians such as nurse practitioners obtain a variety of data about patients in addition to vital signs such as height, weight, blood pressure and pulse, and add these data to the medical record. "It's done all the time in pediatrics using guidelines and protocols. You can do more care if proper training and oversight is provided," Greenes notes.

Practitioners currently supervise from a distance, but that kind of remote supervision is limited in its effectiveness. Such tools as online guidelines and protocols with templates for entering data would allow more direct nursing care, having as an additional benefit the capture of additional structured data in the electronic medical record.

"We're strapped for professional time," says Greenes of physicians and nurses. He suggests the same strategy of using ancillary personnel can be applied to medical specialties. "I'm a radiologist. Non-physicians can read radiological images. You don't need four years of medical school, four years of residency and six months to two years of training at pattern recognition. The same thing goes for other services." Overcoming the traditional turf battles that occur as a result of sharing these roles can be a problem unless doctors can feel secure in their payment base. Physicians should be able to delegate functions, while giving adequate supervision, and run their offices more efficiently and improve the quality of care, he says. "All boats will rise with the tide."

Such strategies will improve nurse productivity, error prevention, nursing satisfaction and record keeping. Perhaps most importantly, nurses will be able to give the care they were meant to give, care that complements the doctors' more disease-oriented approach. "Nurses treat the whole patient. Often patients will tell nurses things that they might not tell their doctors. I think we can take advantage of the special orientation of nurses much more," says

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Greenes, citing the example of a menopausal female patient who needs to choose among three roughly equivalent hormone therapies. Nurses can be trained to help patients negotiate such choices, which depend on factors such as cost and patient values.

"There are ways we can involve nurses to help patients make more informed choices. Doctors are not trained to work that way. A physician might prescribe a care plan without taking the time to discover whether it is one the patient is likely to follow through on," he says.

Risk managers rule

Ideas are one thing, implementing solutions on the scale of a large integrated delivery system is entirely different. Especially for organizations that—except for hiring traveling nurses to fill their gaps—have been too busy with other initiatives to craft a solely technology-based solution to the nursing shortage.

"We're just now coming to grips with the nursing shortage," says Jan Commens, executive director of clinical excellence at St. Louis-based Ascension Health. She says Ascension identified three major team initiatives last spring—care delivery model team, master contracts for travel nurses and a team to share best practices—but that none of them has focused on the level of detail required to make nursing more productive through use of technology. That's not surprising, considering that Ascension has 73 acute care facilities alone, stretching from Michigan to Texas and from the Mississippi River to the East Coast.

That near-continental stretch covers regions with different expectations, staffing strategies and models of care—creating obstacles to standardization. For example, in the case of the care-delivery model team, says Commens, "The idea is not to come up with *the* model, but more global concepts. One of our underlying principles is the idea of distributed leadership.

"I've been involved in several attempts to automate documentation. It's very difficult because of the multitude of opinions on the subject," she says. Commens says it isn't only accreditation groups that generate all the documentation but also internal management. "Risk-management people also demand documentation."

Complicating the issue is the fact that nurses are reluctant to change because they feel it's risky to do so. Unlike physicians who have been taught a common model for writing a patient history, physical and progress notes, nurses receive widely inconsistent instruction on how to document, cobbling together whatever their fundamentals instructors chose to emphasize with tips the nurses learn on the job. Combine that with local risk managers' input, state statutes and accreditation requirements and it makes for a burgeoning obligation on the part of nurses to write more, not less.

Mandates, real and imagined

"There are mandates and then what they think are mandates. This is so complex," says Commens. If clinical organizations could isolate what's really

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mandated versus what's thought to be mandated, using templates to standardize documentation, nursing would dramatically cut the time spent documenting, she argues. And while it's probably true doctors rarely read the things nurses write, doctors also have a lot to say about it whenever an organization wants to try something new. Therefore, changing the way nurses document will also require involvement from physicians.

The bottom line: automating nursing documentation is at best a murky swamp through which to slog. However, to the extent it's possible to automate the process, Commens agrees there's value to such tools as voice-recognition-based dictation systems, portable, wireless, handheld devices and standardized patient-care processes that use simple check-off templates (as opposed to written sentences). Still, "It isn't the technology that's the problem. It's the new concepts and buy-in with nurses and physicians that will create the hang-ups."

As part of Ascension's distributed-leadership approach it regularly convenes "accelerated solution environments" for its executives in order to identify key strategic areas of focus. The care-delivery model, which came out of its spring workshop, will have the most impact on improving nursing productivity, says Commens. An issue raised was the fact that healthcare in Europe and third-world countries relies much more on patient and family involvement, which serves patients well especially when they go home. Applied to the U.S., the approach could involve IT strategies such as Web sites and e-mail and that might help ease the burden on nursing in an indirect way.

Communities of practice

Another concept raised in these forums that could be applied to address the nursing shortage had to do with establishing a more organized way of facilitating networking. In the recent past, Commens says she would receive e-mail questions about what other organizations were doing and then send out an e-mail and hope for a response. The new model involves Web boards focused around "communities of practice" in which people can interact directly.

Ascension is building an intranet Web site that will incorporate, among other things, a nursing community of practice that will be able to tackle complex issues such as addressing the nursing shortage by making nursing more productive. Topics of discussion will likely include streamlining the cumbersome and time-consuming medication-administration process. "There are ways IT could help. Every time a unit secretary does something, an RN has to check it," she says.

Other factors are also amenable to technology in the broadest sense. "One of the big issues is that nurses are older. High-tech beds can be terrific labor savers and can help prevent injuries by eliminating the need for nurses to physically reposition patients. Beds will do just about everything but distribute meds," says Commens. She cites anesthesiology as a specialty that was able to reengineer itself in the last decade by standardizing equipment

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and processes to increase safety and efficiency. "They really are to admired and emulated for the strides they made."

Random beeps in Pittsburgh

The nursing shortage is also very real to Gail Wolf, senior VP and chief nursing officer, at UPMC Health System, a 16-hospital integrated delivery system based in Pittsburgh with hospitals overseas. Married to an economist, Wolf is acutely aware of the demographics: A Baby Boomer turns 50 every seven seconds; and, the generation expected to take care of them has the lowest birthrate in 70 years.

In her job overseeing UPMC's 6,000 nurses, Wolf attacks the nursing shortage with what she calls "R^3," for recruitment, retention and redesign. Redesign further breaks down into three major subcategories:

1. Electronic medical record (EMR);

2. Bringing the principles of Toyota production into healthcare; and,

3. Redesign of RN work, which she considers a short-term solution.

Redesign of RN work has centered on a study she did in the last year in which nurses were assigned beepers so she could randomly beep them day and night, asking:

• What are you doing?

• Is it something you must do?

• Is it something a non-nurse, like an aide, can do?

The survey resulted in three basic insights:

1. Documentation was the most time-consuming task a nurse performed; medication administration was second.

2. There was a substantial amount of work that a non-nurse could do if one was available.

3. There were statistically significant differences between hospitals on the various tasks, yet outcomes were similar.

The second finding validated an international study in which 41% of nurses said that on their last shift they did non-nurse work, leaving nurse work undone. Wolf says the redesign initiative will help ease the nursing burden during the next two years, but won't solve the issue long-term. "Getting nurses to change the way they work is no small strategy," she says.

Birth was easier

UPMC is developing an EMR across the entire enterprise. "It's a gigantic project. Giving birth was 1,000 times easier," says Wolf, who chose to standardize the system because it was based on a single vendor and because clinical documentation was the task that took the most time. Again, her studies validated an AHA study that found that every hour spent by a nurse in the emergency department required another hour of documentation.

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6

UPMC gathered all the documents from its 16 separate hospitals and found it used a whopping 3,000 separate and distinct documents. "We warehoused them," recalls Wolf, and once catalogued, some shocking discoveries were made. "We found that we asked patients, 'Do you have any allergies?' 26 times on average. One hospital actually asked the question 60 times. We asked it in the ER, on the floor, at a physical by the doctor, by the pharmacist, and on and on," she says.

The study also found that UPMC was asking patients about past medical history on average 25 times. Enter the EMR. Using its technology, such questions can be asked once with the answers automatically populating all fields of the medical record. "That will save time," says Wolf, "without even getting into improving the actual quality of care. We'll get a big bang for the buck with the EMR."

Still, "It's a tremendous amount of work. It sound so easy, but it's so difficult. We're two years into this project and it's taking more and more resources."

We don't make cars, but…

Fortunately for Wolfe, applying industrial principles to the clinical setting has provided a refreshing complement to the nose-to-the-grindstone experience of implementing an EMR. Paul O'Neill, current U.S. Secretary of the Treasury and former chairman and CEO of Pittsburgh-based Alcoa, had adopted Toyota production principles at Alcoa. O'Neill brought them to UPMC's attention through participation in the Pittsburgh Regional Healthcare Institute formed two years ago. PRHI set two goals: 1. Eliminate medication errors and, 2. Eliminate hospital-acquired infections.

"Basically, we said, 'While we don't make cars, we certainly have a lot of processes screwed up,'" she says. As a result, UPMC established four "learning lines" or experimental groups to redesign systems focused on medication. Since then, they have also established another learning line around hospital infections.

Wolf is enthusiastic about applying an industrial model to analyze and reengineer traditional healthcare processes. "It's complex in its simplicity. What I love about it is that it puts change in the hands of employees." The approach involves taking a problem step by step back to its root cause.

For example, once when observing medication administration at a hospital, she noticed the 9:00am medication had not arrived on time. She went back to the pharmacy and, after a litany of questions, found that the medication was not on the shelf because it was an unusual drug the pharmacy technician didn't know they were out of. That was because, unlike most meds, it lacked its own storage bin, which when empty would have signaled it was time to order more. Wolf's solution: Create a bin for every medication the hospital needed to stock.

Asking why

"It's little things like that that combine to create a solution. You keep asking,

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'Well, why did that happen?' until you finally arrive at the root cause of the problem. The principles are so basic. We've been able to make huge progress in a relatively short period of time," Wolf says. Employing such a strategy has enabled UPMC to cut missing medications by 55% in just 30 days. In another case, a learning line found that the 8:00am medications at a hospital were always late. It turned out the pharmacy delivered them late because the pharmacist, oblivious to the situation, didn't come in until after 8:00am. When apprised of the issue, he changed his schedule to accommodate the 8:00am meds. Problem solved.

"Until you observe and start asking questions, you don't realize all that's going on. It's not really rocket science. Unlike TQI [total quality initiative], this changes processes on a very small level and just keeps improving it until you get it right," says Wolf.

This is a case, however, when technology is not necessarily the key to success. "Toyota really doesn't use a lot of technology in its plants. When we're designing pieces for the EMR implementation, I find myself thinking like Toyota, eliminating unnecessary steps in work," says Wolf, who adds that the three initiatives are still "half-cooked" and whose overall benefits have not yet been quantified. Intuitively, however, she believes the initiatives have already achieved dramatic timesavings for nurses and other staff.

UPMC also uses more traditional tools to help improve productivity. For example, 10 years ago, the organization developed MRS, for management reporting system, an extensive information system that helps assess human resource and other needs throughout the enterprise.

Building the church
"Three years ago when we implemented MRS at University Hospital, we saved more than $2 million without a single layoff just by arranging staff better. Says Wolf—in a comment that might serve as a statement for the age in healthcare—"It used to be that we built the church for Easter Sunday and staffed for Easter Sunday. Now we have to plan shift by shift."

"As a physician married to a physician, I recognize the nursing shortage as a hot topic, and the use of technology to help solve it on the surface looks like a great idea," says Thomas Handler, M.D., research director for the Gartner Group based in Stamford, Conn. After three years of analyzing nursing documentation systems as part of computerized medical records and from his own clinical experience, he, like many, determined that much of what nurses document is a waste of time and effort. "However, that's not a technology issue. We need to do the process reengineering first," he says.

Members of groups such as the Scottsdale Institute, Handler suggests, can collaborate to identify the minimum amount of documentation required for medical/legal purposes and for communication with doctors and other nurses. "Having said that, we can then look at how technology can help us do what would otherwise be cumbersome and inefficient," he says, citing as an example the habit of some nurses writing vital signs on a patient's bed sheet. "Clearly,

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a handheld data-entry device is a much better alternative. What you want is the technology to fit into the workflow."

Handler says that in addition to state governments and risk managers, nurse managers are a major factor in over-documentation because they tend to encourage nurses they supervise to err on the side of writing more than less. And he believes any effort to streamline documentation should begin by questioning what's being documented in the first place. "Charting by exception is just a faster way of charting all this useless information."

Conclusion

Erica Drazen, VP of FCG's Emerging Practices group, asserts that smart use of technology can have a dramatic impact on the nursing shortage. She recommends healthcare provider organizations take the following steps:

Reducing the amount of documentation and better incorporating information capture into daily routine will free up significant amounts of clinician time. Identify the minimum amount of required documentation for hospitals to provide quality, compliant care.

- Develop templates on mobile computing devices to support data capture at the point of care that would be both comprehensive and non-repetitive

Technology can improve communication and coordination of services, easing frustration for caregivers and patients alike.

- Provide patients with devices that record their activities and whereabouts within a facility so that when patients show up for tests, the lab would be ready—or that when ancillary services come to the patient, they know that the patient will be there.

- Provide nurses with cell phones with headsets and features, such as physician speed-dial, to ease communication.

Technology can also help address the lack of faculty, training and education programs that limit the necessary expansion of the nursing workforce.

- Support expanded and flexible education programs accessible anytime anywhere.

- Provide innovative e-learning tools to reach underserved and untapped student populations.

Technology can also support caregivers to make the less skilled more safe and the highly skilled more efficient.

- Support the use of clinical computing tools and technology that issues alerts and reminders to ensure timely responses.

- Examine medical equipment to promote greater use of fail-safe mechanisms.

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Joanne Sunquist, VP of information services at Allina Hospitals and Clinics in Minneapolis, agrees that patient tracking can be a great time-saving tool, especially when integrated with automated scheduling. "Another great time saver is the integration of monitoring data such as that from blood pressure monitors, thermometers and IV pumps directly with the EMR," she says, adding that it is also important for facilities to have a single "front end portal" that allows nurses a single sign-on to access patient information from multiple systems like radiology and laboratory.

Automated pathways, care plans and knowledge-based orders are all valuable technology enablers. Says Sunquist, "Anything that automates the work processes saves nurses' time."

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[i] The statistics in this report are copyright First Consulting Group. Specific sources from that FCG research are footnoted. The first is Buerhaus PI, Staiger DO, Auerbach DI. Implications of an Aging Registered Nurse Workforce. JAMA June 14, 2000; 283(22): 2948-2954.

[ii] Hospitals & Health Networks, June 2000

[iii] MSNBC, 2000

[iv] "Nurse Staffing and Patient Outcomes in Hospitals" US Dept. of Health and Human Services, 2001

[v] "The Nurse Shortage" The Federation of Nurses and Health Professionals, 2001

[vi] Buerhaus PI, Staiger DO, Auerbach DI. Implications of an Aging Registered Nurse Workforce. JAMA June 14, 2000; 283(22): 2948-2954.

[vii] American Association of Colleges of Nursing, 2001.

[viii] "Oregon's Nursing Shortage" NWHF, 2001

[ix] "Who Will Care for Each of Us" Panel of the Health Care Labor Force in a Graying Society, University of Illinois at Chicago, 2001.

Members of the Scottsdale Institute can collaborate to identify the minimum amount of documentation required for medical/legal purposes and for communication with doctors and other nurses. If you are interested in such a collaborative, contact Shelli Williamson at 888-294-8804 or swilliamson@fcg.com.

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