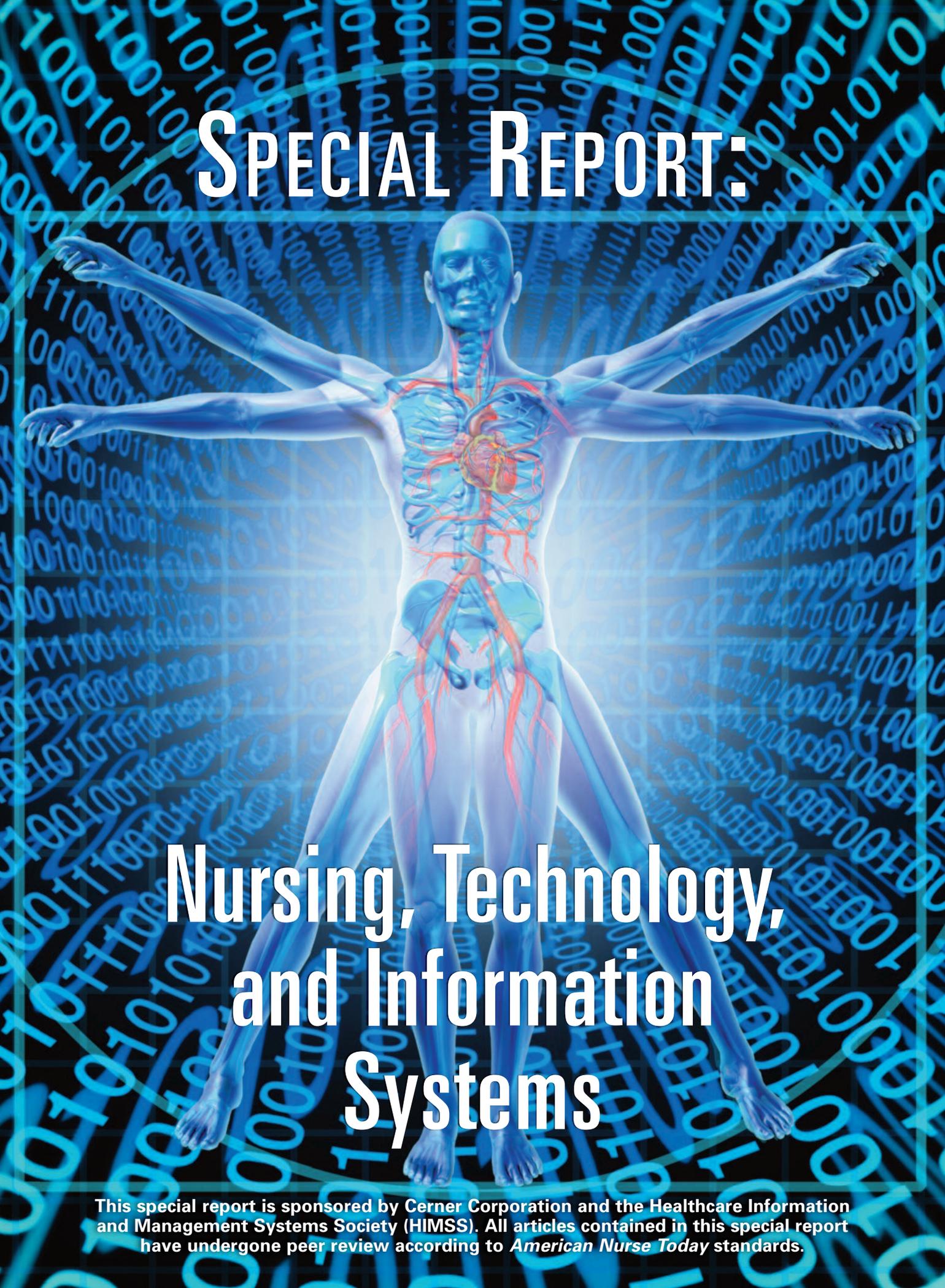


# SPECIAL REPORT:



## Nursing, Technology, and Information Systems

This special report is sponsored by Cerner Corporation and the Healthcare Information and Management Systems Society (HIMSS). All articles contained in this special report have undergone peer review according to *American Nurse Today* standards.

# Enabling the ordinary: More time to care

Pamela F. Cipriano, PhD, RN, NEA-BC, FAAN, and Susan Hamer, DEd, MA, BA, RGN

*Versions of this article appear in American Nurse Today (United States) and Nursing Times (United Kingdom) to acquaint readers with common goals, challenges, and advances in using health information technology to enable nurses to provide safer and more efficient care.*

**A**round the globe, in every setting, nurses seek to provide care to patients and families to keep them safe, help them heal, and return them to the highest possible level of functioning. Nowhere is the struggle to achieve these simple aims more apparent than in hospitals. The tightrope of balancing what nurses believe to be adequate resources for high-quality care and the affordability of these required resources are often at odds. Disagreement among leaders in healthcare delivery systems as to how to allocate nursing resources has led to tension and discord. Despite decades of research showing that the amount of care provided by registered nurses directly affects mortality and morbidity, nurse leaders continue to have to justify requests for nursing resources.

Universally, the desire to make care more affordable has fueled efforts to make care more efficient and effective. The public recognizes this means examining all aspects of care in the pursuit of cost-reduction measures that will not reduce quality. In the United States, nurses continuously rank as the nation's most trusted professionals by the Gallup Poll and have the public's support whenever belt-tight-

## The value of technology in automating and improving patient care

ening issues come to the forefront. On the other hand, in the United Kingdom (UK), the debate over resources that has been playing out in the media has caused confusion and public uncertainty as to whom to believe, undermining confidence in the system as a whole. The nursing profession hasn't been spared this negative view and has needed to reassure the public of its core values and purpose—that caring and compassion are part of the core business of nursing.

Nursing is what nurses do, and what nurses do is coordinate and deliver care. So although the context, technology, and health needs of our populations have changed, nurses remain the foremost providers and coordinators of care.

Why state something so obvious? Showcasing the caring aspects of nursing in a technologically dominated world is challenging. Technology enables care and enhances safety by automating functions both simple and complex. It doesn't replace nurses. As one expert cautions, automation should occur *in* nursing, not *of* nursing. The value of technology hinges on how it's used and whether it helps or hinders care.

### Changing nursing practice safely

So why do nurses have to struggle so hard to get the technology we need to support our practice? And when this technology is available, why don't we reap the



benefits we've been seeking for our practice?

For years, many in the healthcare community believed nurses were too slow to embrace new technologies and might disrupt or even obstruct the change process. Had they ever visited a neonatal or intensive care unit? Although their description of nurses and nursing wasn't accurate, it had become a mantra within a wide variety of organizations.

What they failed to grasp, and continue to misunderstand, are the practical realities of how professions change and how to support innovation in practice. For generations, nurses have changed their practice successfully and have adapted to new challenges, such as coping with rising patient acuity, safely delivering dangerous drugs, and preventing adverse events. And they did this in a world where management theories were only beginning to address nursing and healthcare settings.

At times, the need for change has been critical and the response of the nursing profession has been swift. Of course, we can all acknowledge there are aspects of care we should have changed but have resisted. Nursing professionals have sought to understand how to change our practice and increase the available evidence on which to base our care. We understand how to change practice safely and how to sustain those changes.

### Shared vision for technology: Enhancing care

The United States and UK share similar goals for technology innovation but differ in the economics and delivery-system configurations. (See *Comparing the U.S. and UK health systems*.) With the technology explosion, many healthcare organizations have sought to add new systems rather than integrate existing ones—usually without knowing

## Comparing the U.S. and UK health systems

Despite some fundamental differences, healthcare delivery systems in the United States and the United Kingdom (UK) share a national commitment to quality and the role of nurses in improving care. In both nations, nurses are expanding the use of health information technology tools to improve safety and efficiency and involve patients in their care. The chart below compares some features of the U.S. and UK health systems.

Feature	United States	United Kingdom
<b>Payer(s)</b>	<ul style="list-style-type: none"> <li>• Government</li> <li>• Private insurance companies</li> <li>• Self-pay</li> </ul>	<ul style="list-style-type: none"> <li>• Government (National Health Service [NHS])</li> <li>• Private insurance companies</li> <li>• Private payers</li> </ul>
<b>Delivery system</b>	<ul style="list-style-type: none"> <li>• Hospital centric (government or private)</li> <li>• Increasing shift toward illness prevention and more ambulatory, home, and post-acute care</li> </ul>	<ul style="list-style-type: none"> <li>• Strong community-based care with primary-care focus</li> <li>• Hospitals run by trusts (public-sector corporations providing services for the NHS)</li> </ul>
<b>Technology vision</b>	<ul style="list-style-type: none"> <li>• Electronic health record for all citizens by 2014</li> <li>• Improved availability, quality, and safety of information</li> </ul>	<ul style="list-style-type: none"> <li>• Paperless system by 2018</li> <li>• Improved availability, quality, and safety of information</li> </ul>

### *The United States and UK share similar goals for technology innovation but differ in the economics and delivery-system configurations.*

if the addition would increase the workload or change work practices or whether it would be acceptable to patients. Organizations supported technology implementation to achieve business goals, whereas nurses saw practice development as the real goal.

The focus on the business case addressed primarily organizational benefits, such as the desire for technology to replace staff time and the ability to market to patients the use of “cutting-edge” devices and electronic record systems, not patient experience and outcomes.

Many of these organizations treated technology to help nurses deliver care as a separate case, viewing it as an additional cost to services rather than a mechanism to enhance care. Thus, the possibility of being unable to sustain the technology was always real.

Increasingly, health technology projects have been seen as special projects that need special teams set up by senior managers, some of whom are unfamiliar with the care setting. These managers seem to struggle with focusing on supporting frontline practitioners to deliver care. Managers have failed repeatedly to enable ordinary day-to-day care with technologies.

The need for technology to support practice was demonstrated by findings from the Technology Drill Down project of the American Academy of Nursing's Workforce Commission. Frontline nurses and other multidisciplinary care team members stressed the importance of involving di-

rect caregivers in technology design, selection, and testing—steps often overlooked in the haste of acquiring systems or devices. (See *Making care safer and more efficient with technology*.)

Technologies designed for and used by nurses at the point of care haven't always been easy to use. A recent international survey seeking to identify priorities for nursing informatics research on patient care acknowledges that despite the growing evidence base on the design and evaluation of health information technology (HIT), these technologies focus mainly on medical practice. The study found that the two most highly ranked areas of importance were the development of systems to provide real-time feedback to nurses and assessment of HIT's effects on nursing care and patient outcomes.

### Agenda for leadership

We know how to support high-quality professional practice development and what conditions enable professions to change rapidly. If a profession is encouraged to annex new forms of knowledge and opportunities, it can rapidly develop appropriate practice to self-adapt. This is the route to successful, sustainable innovation. Nurses must address the leadership challenge of how to respond to and accelerate adoption of technologies to support practice. We need nurse leaders who see technologies as promising solutions, not problems, and are able to integrate technology into their vision for meeting practice needs. Nurse leaders need to model and promote examples of enabling technologies and demand systems that meet practitioners' needs.

As technology matures, nurses and other healthcare professionals should be able to collect information only once and see it reused often. Management information should serve as a

## Making care safer and more efficient with technology

The American Academy of Nursing's Workforce Commission recognized the importance of effective technologies in improving the safety and efficiency of care and in helping to return time to nurses for essential care. The Commission's Technology Drill Down (TD2) project, funded by the Robert Wood Johnson Foundation, addressed another looming nursing shortage in an attempt to reduce demand for nursing care. Aimed at finding technological solutions to workflow inefficiencies on medical-surgical nursing units, TD2 brings together multidisciplinary teams to review the current state of nursing workflow, design the desired future state, and brainstorm technology solutions to fill gaps—with the overarching goal of providing safer, more efficient care.

The Commission found that in the 25 acute-care hospitals involved in the TD2 project, most units already had supply storage systems, electronic nurse documentation, provider order entry, and several other automated systems in place, such as telecommunications equipment and drug-dispensing units. Nurses wanted technology solutions to eliminate or automate work, perform required regulatory functions, and provide ready access to resources. They were disappointed that much of the existing technology wasn't user-friendly and required work-arounds. Nurses also stressed the importance of vendors listening to the voice of the staff nurse to make technology more functional and meaningful. They recognized the value of technology in eliminating waste in the nursing workflow due to inefficient work patterns, interruptions, or distractions; missing supplies; and inaccessible documentation. These findings support the business case for using technology to return more time to direct nursing care and to improve communication and implement other safeguards available through smart devices.

byproduct of excellent clinical practice and drive standards for high-quality data from nurses. The profession has made progress in dispelling the myth that nurses are slow technology adopters. With the help of nursing informatics experts, nursing leaders must continue to debate the issues that will help us leverage technologies to improve care and efficiency and achieve the promise that health technology can transform care. ■

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# Collaborating on technology: A learning exchange between U.S. and U.K. nurses

Christel Anderson, MA, and Cathy Patterson, MSN, RN, MHA

**T**echnology implementation in the clinical setting isn't a project but rather a transformation of the delivery system. As healthcare services in the United States and United Kingdom (UK) embrace technology to drive reforms in quality and efficiency, growing opportunities exist to share experiences between the two countries. Today, many global nursing dialogues are sharing lessons about community-care delivery models, nursing governance and adoption, interprofessional communication tools, and patient portals.

Now is the time to share practices in nursing informatics globally. This is essential to the success of the journey toward health information technology (HIT)-enabled transformation. Although many nurses might focus on differences in payment models and delivery methods between the United States and the UK, significant commonalities and experiences exist that each country can share with the other. These were explored in June 2013 by a group of UK nursing leaders who visited the United States.

## Nursing informatics immersion study

The 2013 UK Nursing Informatics (UK NI) Leadership U.S. Immersion Study was a joint effort by the Healthcare Information and Management Systems Society (HIMSS), HIMSS Europe, and Cerner Corporation. These partners launched a year-long initia-

**An immersion study found that shared governance helps healthcare organizations keep up with technology.**

tive aimed at promoting UK nurses' role in implementing and using information technology (IT).

A hosted nursing-leadership delegation trip to Chicago culminated the initiative. A 10-person delegation of nursing informatics leaders was selected from across the UK to meet with U.S. nursing informatics leaders, visit key U.S. healthcare facilities that use nursing informatics to deliver care, and meet with other providers, suppliers, and government leaders. The delegation explored innovative technology, met with nurse executives, and spoke with nursing informatics

colleagues at three Chicago healthcare facilities, all of which have achieved Magnet Recognition® from the American Nurses Credentialing Center. Many Magnet® attributes became apparent to the delegates during these visits. (See *Understanding the Magnet Recognition Program*.®)

Each of the three facilities had a specific focus:

- Advocate Illinois Masonic Medical Center: Connecting the community through informatics
- Northwestern Memorial Hospital: The connected patient
- Ann & Robert H. Lurie Children's Hospital of Chicago: Technology architecture and design.

## Emerging ideas

Introduction of robust and sophisticated clinical information systems has prompted significant transformation in health care and focused greater attention on patient safety and outcomes. Healthcare systems are under increasing pressure to improve efficiency while standardizing and streamlining organizational processes and maintaining high-quality care.

## Understanding the Magnet Recognition Program®

The Magnet Recognition Program® is an international organizational credential granted by the American Nurses Credentialing Center that recognizes nursing excellence in healthcare organizations. It's based on research indicating that creating a positive professional practice environment for nurses leads to improved outcomes for patients and staff. Standards for obtaining Magnet Recognition® are based on research. Components of the Magnet® Model include: transformational leadership; structural empowerment; exemplary professional practice; new knowledge, innovations, and improvements; and empirical outcomes.

The current knowledge explosion in health care requires clinicians to learn about and integrate information systems into their already demanding daily practice.

As part of the nursing informatics immersion study, several key concepts common to both the U.S. and UK nursing professions emerged. These include a culture of inquiry, shared governance and accountability throughout the organization, visible nursing leadership, and real-time data reporting through the use of quality dashboards.

### **Culture of inquiry**

Working closely with bedside clinicians and the IT department, the nursing informatics team is responsible for development, implementation, and support of new systems. It's also instrumental in fostering a culture of inquiry among the workforce. Giving frontline staff access to data provides a scholarly approach to change and transformation that emphasizes evidence-based practices and research.

### **Shared governance and accountability**

The shared governance model gives clinical nurses a voice in determining nursing practice, standards, and quality of care. This empowers nurses to use their clinical knowledge and expertise to develop, direct, and sustain their professional practice. Interprofessional councils and committees allow the nursing informatics team to contribute to and share accountability for decisions made about patient-care delivery. Patients also participate in councils to bring their unique voice.

### **Visible nursing leadership**

Presence of fully engaged nursing leaders with a shared vision aligns with the Magnet philosophy and the Magnet model component of structural empower-

## **Delegates' comments**

Delegates from the United Kingdom Nursing Informatics Leadership U.S. Immersion Study made the following observations during their visit to three American healthcare facilities:

“Informatics is taken very seriously across all levels of this organization and is integral to care delivery. Nurses are fully engaged in the process.”

“Informatics, safety, quality, process change, education, and research were all pulled together into one nursing department.”

“If you separate technology from the normal clinical practice of nursing teams and put it on top of the nurses' normal workload, you're doomed to fail.”

ment. Professional practice flourishes under influential leadership, creating an environment where innovation is encouraged, adopted, and sustained. Although the three organizations the delegation visited had different leadership models, an underlying theme was the need for a clinical leader, such as chief medical information officer (CMIO), chief nursing information officer (CNIO), or director of informatics. Nursing informatics leadership is integral to help promote and drive the organization's clinical vision and provide the underpinnings for a successful roadmap.

### **Real-time data reporting with quality dashboards**

Quality data are informing practice at the bedside through real-time dashboards at each facility. The electronic systems were designed to monitor and capture adherence to indicators required by government and nursing standards. One of the facilities had unit-based quality message boards that informed patients and families of monthly quality outcomes.

### **Key findings**

The immersion study found that organizations that empower their staff structurally by using interprofessional shared-governance models have the capacity and agility to deliver clinical decisions and transfor-

mation to keep up with technology. Another key finding was that supporting leadership roles, such as chief clinical information officer (CCIO), CMIO, and CNIO, champion the clinical voice and bridge the gap between the IT department and clinical staff. (See *Delegates' comments*.)

Clinical transformation is a continuous process that involves assessing and continually improving the way patient care is delivered at all levels. It occurs when an organization rejects existing practice patterns that deliver inefficient or less-effective results and instead embraces the common goals of patient safety, improved clinical outcomes, and quality care through process redesign and implementation. By effectively blending people, processes, and technology, clinical transformation occurs across facilities, departments, and clinical fields of expertise. Constant measurement and analysis of how practice has developed or changed from the point of delivery is crucial for ongoing quality delivery. Analysis of clinicians' workflow is needed to determine if the current amount of direct care being delivered is enough to provide not only good outcomes but also compassionate bedside care. ■

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# How nurses drive rapid electronic records implementation

Liz Johnson, MS, CPHIMS, FHIMSS, RN-BC, and Dorothy I. DuSold, MA, CPHIMS

In 2010, Tenet Healthcare launched an aggressive roll-out of electronic health records (EHRs) at 49 hospitals in 12 states, to be completed by spring 2014—only 4 short years. Although federal meaningful-use incentives contributed to our desire to accelerate the schedule, the main driver was to improve patient care through technology, achieving both meaningful use and meaningful care.

To reach this goal, we knew our project, called IMPACT (Improving Patient Care through Technology) had to be clinician-driven. We needed to design a repeatable methodology that targeted sustainment, not implementation, as the success criteria. Our challenge was to involve clinicians at all levels of the organization in planning and implementing the EHR so

## Nurses in one large healthcare system are involved at all levels of EHR implementation.

they would own the “care and feeding” of the clinical system beyond the go-live date. As a result, nurses have played, and continue to play, critical roles at all levels, including project and hospital leadership, standards and governance, and training and support.

### Project leadership

As Tenet’s vice president of applied clinical informatics, au-

thor Liz Johnson is the executive leader for IMPACT. Her focus is on maximizing use of the electronic record environment to improve care, rather than just implementing clinical systems. A registered nurse, Johnson is co-chair of the implementation workgroup of the federal Health Information Technology Standards Committee. In 2010, she received the Nursing Informatics Leadership award from the Healthcare Information and Management Systems Society (HIMSS). She brings both clinical and public policy perspectives to the project. One-third of Johnson’s senior directors and half of her directors are nurses, providing a balance of clinical and technical talent to the leadership team.

### Hospital leadership

Every Tenet hospital has a clinical informatics director—a nurse



who serves as the clinical leader during EHR implementation and acts as clinical guardian for post-implementation system and workflow optimization. Each hospital's chief nursing officer (CNO) leads the multidisciplinary clinical-process improvement committee that defines new workflow, policies, and procedures to improve efficiency in the electronic environment. In many Tenet hospitals, the CNO also serves as the hospital executive sponsor for IMPACT, providing the drive and sense of urgency to the organization.

### Standards and governance

To realize the full benefits of the EHR, our organization recognized the importance of developing and maintaining the clinical standards that are used across our hospitals. As EHR implementations reach a critical mass, this will enable us to mine the data in a meaningful way, identifying opportunities to improve patient safety and gain efficiencies.

Nurses play a key role in defining these clinical standards. They participate in clinical advisory teams with other clinicians to set the standards embedded in the EHR. Hospital nursing representatives collaborate with regional and national nursing leaders on the nursing advisory team. Nurses also participate in the clinical leadership council, comprising chairs of all advisory teams, to approve standards that cross multiple disciplines. In addition, teams of nurses are responsible for translating clinical standards into clinical system designs that are built into the EHR. Each team specializes in different aspects of the system, such as obstetrics, emergency department, surgery, perioperative services, general nursing, orders, and others.

### Training and support

Nurses play a significant role in

EHR training and ongoing support throughout the organization. At the hospital level, nurses fill most of the training and "super-user" roles during EHR implementation to prepare colleagues. After implementation, many continue their roles to provide new employee training, refresher sessions, and support during clinical system upgrades, enhancements, or added functionality. At the enterprise level, nurses account for a high percentage of our clinical support teams, including a special clinical help desk that serves physicians.

*Tenet's EHR project has led to new career-development opportunities for nurses within the organization. Many nurses continue to provide post-implementation optimization and new functionality design.*

Tenet's EHR project has led to new career-development opportunities for nurses within the organization. Many nurses continue to provide post-implementation optimization and new functionality design. The most significant addition to Tenet's core competencies is the creation of a clinical informatics director position at each of its 49 hospitals. Nurses in this role represent all clinical disciplines, ensuring alignment of workflow and practices across the continuum of care within each hospital. They also serve as change agents and are educated on the principles of behavioral-change management, following a formal methodology. The organization has developed a formal clinical informatics program to recruit, educate, and continuously mentor our clinical

informatics directors.

Since the inception of IMPACT, we've hosted three clinical informatics academies, providing continuing education credits to more than 70 nurses. We've also developed a skills assessment to provide guidance to clinical informatics directors in their development and performance. Recently, we conducted a behavioral analysis of our clinical informatics population and identified the "behavioral DNA" of our top performers.

Tenet nurses are playing a critical strategic role in enabling rapid EHR implementation across our health system. They've had a tremendous influence on the continuous improvement of our repeatable EHR implementation methodology, which accounts for our ability to sustain an aggressive rapid rollout schedule across a large enterprise. We conduct formal "lessons learned" sessions after each hospital implementation and incorporate follow-up actions in our methodology for future implementations. Because of such feedback, our 2013 hospital implementations achieved higher performance in such areas as computerized provider order entry use and online medication reconciliation use, compared to initial hospital implementations. Our nurses are involved at all levels of the project implementation, as well as the ongoing operational support systems. ■

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# How electronic health records are improving health care for elderly patients

Barb Duffey-Rosenstein, RN, MSc, and Samir K. Sinha, MD, DPhil, FRCPC



Older adults account for more than one-third of acute-care hospitalizations and 58% of hospital days in Ontario, Canada. Leaders and staff at Mount Sinai Hospital in Toronto, Ontario, recognized that the current hospital system was designed to meet the needs of a younger population, not frail older adults. To better address the needs of frail older adults, the hospital sought to develop programs and tools that would help caregivers deliver the right care in the right place at the right time.

## Acute Care for Elders strategy

Mount Sinai was able to seamlessly implement and enhance its Acute Care for Elders (ACE) strategy with its frontline clinicians and informatics department, in part because Cerner Millennium® was already established as the hospital's electronic health record (EHR) platform. The informatics department staff met frequently with frontline caregivers to understand their needs and the care they sought to provide.

Key components of the ACE strategy include six evidence-based admission order sets (the general ACE unit order set and sets for older patients with chronic obstructive pulmonary disease, heart failure, cellulitis, pneumonia, and hip fractures). The ACE superset contains several admission order sets and ensures ACE-specific protocols are used in the care of every older patient. They also ensure patients receive optimal medications and care proto-

Innovative information technology tools help ensure patients get the right care at the right time.



cols as quickly as possible so that consultations with specialists and allied health providers can begin much earlier.

ACE also integrates documentation of key geriatric clinical process and outcomes indicators into Mount Sinai's existing clinical documentation tools. These indicators populate the vital signs section of the health record to better support the care of frail elderly patients and help monitor the overall quality of care being delivered.

Also, a more seamless integrated service delivery model has been implemented at several points in the hospitalization process and within several teams. This model promotes initiation of appropriate care in the emergency department (ED) and

helps coordinate patient care in real time. Development of a real-time ACE report providing the location of ACE-designated patients across the hospital helps staff identify these patients more easily, aids transfer prioritization to the ACE unit, and allows staff to initiate best-practice care protocols wherever they may be.

## Linked communication system

In addition to these hospital-based strategies, point-of-care interventions across the continuum of care have been enhanced by the creation of an email-notification and communication system regarding frail community-dwelling patients in the Mount Sinai/Community Care Access Centre (CCAC) Integrated Client Care Project (ICCP) and the House Calls program. If one of these patients requires an unscheduled trip to the ED, the patient's arrival in the ED triggers email notification, promoting communication about the patient's care.

The goal of this linked communication process using secure email is to enable important information exchange among clinical team members who know the patient at different points along the care continuum. Ideally, this information exchange is solution focused, aimed at avoiding hospitalization whenever possible and helping the patient return to the community as soon as possible. ■

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# Progress report: Electronic health records and HIT in the United States

Judy Murphy, RN, FACMI, FHIMSS, FAAN



What an exciting time to be a healthcare provider in the United States. All types of providers, along with their patients, are realizing the power of health information technology (HIT) as a tool to assist each person's journey toward better health and better care at lower cost. From where I sit in the Office of the National Coordinator for Health Information Technology, I'm encouraged every day by the leadership and clinical innovation occurring across the nation in this time of profound change—especially among nurses.

So let's look at how we got to where we are today. Passage of landmark healthcare reform legislation, including the Health Information Technology for Economic and Clinical Health (HITECH) component of the American Recovery and Reinvestment Act in 2009 and the Affordable Care Act (ACA) in 2010, has changed the landscape of the U.S. healthcare industry forever. HITECH created the Electronic Health Record (EHR) Incentive Program, administered by the Centers for Medicare & Medicaid Services and the Office of the National Coordinator for Health Information Technology. The program provides financial incentives to eligible professionals and hospitals that implement,

Electronic health records, HIT, and nursing informatics are transforming American health care.

adopt, and meaningfully use certified EHRs.

The program has worked. In 4 short years, EHR adoption has risen dramatically. As of July 2013, 60% of eligible professionals (312,072 of 521,600) and 81% of eligible hospitals (4,051 of 5,011) were participating in the voluntary program and had received a Medicaid or Medicare EHR incentive payment for either meeting the meaningful use criteria or fulfilling the requirements for adoption, implementation, or upgrade of a certified system.

The Obama Administration encouraged EHR adoption with the passage of HITECH in 2009, because EHRs are an integral element to drive healthcare quality and efficiency improvements and are foundational to the healthcare delivery and payment reform needed to transform the industry. Thus, EHRs are critical to the broader healthcare improvement efforts that are part of the ACA. These efforts—improving care coordination, reducing duplicative tests and procedures, focusing on high-quality outcomes, and rewarding providers for keeping patients healthier—are all made possible by wide-

spread use of EHRs and data sharing among EHRs through health information exchange. EHRs manage health information in ways that are patient centered and give all providers the ability to better coordinate care, consistently deliver best practices, and reduce errors and readmissions that can cost more money and leave patients less healthy.

## From silos to interconnectedness

During this transformation from disconnected, inefficient, paper-based “silos” of care delivery to an interconnected, interoperable data system driven by EHRs, the importance of nurses and nursing informatics has become increasingly evident. For decades, nurses have contributed proactively to the development, use, and evaluation of information systems. Today, they constitute the largest group of healthcare professionals working in HIT and are integrally involved in EHR selection, implementation, and optimization. Nurses serve on national committees and initiatives focused on HIT policy, terminology and standards development, health information exchange, and EHR adoption. In their frontline roles, they are having a profound impact on healthcare quality and costs, and are serving as leaders in the effective use of HIT to improve the safety, quality, and efficiency of healthcare services. Yes—it's a remarkable time to be a nurse in the United States. ■

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# Paperless in the United Kingdom: National Health Service goal for 2018

Anne Cooper

**N**urses on the front line of care in the National Health Service (NHS) of the United Kingdom (UK) are acutely aware of the pressures facing the health service. Rising demand for services (particularly emergency services) and a tight financial environment mean we all need to do more with less.

We're also well aware of the impact these pressures place on our daily jobs and ability to spend valuable time with patients. To maintain a focus on quality, last year NHS England launched the "Compassion in Practice" nursing and midwifery strategy. This brought together the "6 Cs"—care, compassion, competence, communication, courage, and commitment—as the underpinning values of the profession.

Given this pressured environment, why did UK Health Secretary Jeremy Hunt in January set out his priority for the NHS to be paperless by 2018? The answer is simple: Only by embracing technology can the NHS meet the challenges it faces over the next decade and beyond.

While the history of health information technology (HIT) in the NHS is a complicated one, there's no doubt that technology has the potential to contribute directly to improvements in care. Technology can free up nursing time by digitizing such processes as early warning scores, nurse rounding, device integration, digital pens for the community, and supporting communication between clinicians. What's more, the simple

**The National Health Service must embrace technology to meet the challenges it faces.**

act of capturing patient information on an electronic rather than paper record means patients' details and medical history can be made available to clinicians at the point of care easily and accurately. Earlier this year, NHS England detailed a vision for making an integrated digital care record for each patient available across the NHS—one that reinforces the active role nurses must play in embracing technology to capture and share patient information electronically.

The next step will be for nurses across the NHS to use this information to change and improve the way they work, closing the feedback loop on the care process. Based on electronic patient records, the UK government's care.data initiative will draw together and link individual patient information from across primary, secondary, and acute-care settings, making it available to clinicians, providers, payers, and patients themselves. This will allow analytical insights to be drawn on how all parts of the health system can contribute to improvements in outcomes.

However, the NHS must be careful to avoid information

overload. Too often, centralized data reporting requirements that start with the right aims become bureaucratic burdens on nurses' time. NHS England is working with providers through the NHS Confederation on the "Busting Bureaucracy" campaign to remove duplications and redundant data from the system, making sure it captures only the data most valuable to improving outcomes.

Clearly, getting the most from technology requires investment. The first aspect is financial: The government recently released a dedicated £100m nursing-technology fund (equivalent to about \$160 million U.S. dollars) to help hospitals get the systems they need. This is backed up by a broader £500m investment in health technology made available to acute trusts over 3 years to 2015-2016.

The second investment is a professional one. Getting value from technology and information requires training, strategic planning, and an appetite to use health data to improve the way we work. It will require nurses, midwives, and health visitors to take on the leadership challenge across all levels of organizations. ■

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# Preparing for electronic health records in the UK

Gerry Bolger, MHM, RN, Fergus Keegan, MBA, DMS, RGN, and Cathy Patterson, MSN RN, MHA

The single biggest change to nursing in a generation in the United Kingdom (UK) is the transition to a paperless National Health Service (NHS, the publicly funded healthcare system) by 2018. It offers an opportunity to radically improve the quality of care by using better information to make faster, safer clinical decisions. The challenge for nurses is to seize control of that change, using our expertise to shape the technology rather than letting the technology shape us.

The lesson from early NHS adopters of information technology (IT) is clear: Success hinges not on IT wizardry but on nurses' willingness to lead the change they want to see. We have the chance to redefine what excellent care looks like. The test now is to make that a reality.

When challenging timelines are set, it's all too easy to focus on the "when." But for transformation to succeed, nurses first need to understand the "why." That means putting information at the heart of clinical strategy. Too often, we make crucial decisions based on the pieces of information we have, not the complete picture we'd like to have. If we get it right, it's in *spite* of the information, not *because* of it. That's frustrating for us and dangerous for patients.

As early adopters of the information challenge, we've seen how things can be different. Where nurses have access to information at the bedside, they

The transition to a paperless health system is a chance for nurses to shape the technology.

can make quicker decisions. Where they're free from administrative burdens, they have more time for patient care. Where automated alerts prevent medication errors, patients are safer. Information underpins improved care.

## A chance for nurses to influence the IT agenda

The drive to a paperless NHS in 2018 is an opportunity to influence the information agenda. It's a chance to shape the underpinning technology, ensuring it provides the data we need to make the right decisions. The danger is that nurses may fail to grasp the scale of this opportunity. We all need to understand that this isn't a back-office IT project with a start point and end point. It's a clinical transformation project that will continually improve the quality of care. Technology is the means to enhance outcomes, not the end in itself.

The NHS isn't facing this challenge from a standing start. Some trusts already are using improved information to improve patient outcomes. Experience from early adopters offers

valuable lessons for those who will follow in their footsteps. (See *First things first: Assess existing processes.*)

## Visible clinical leadership

Clinical improvement requires visible clinical leadership. Clinicians must define medical objectives and communicate how these will be achieved. When the authors helped design the technology systems for our own hospitals, we provided a more holistic view of patient care, advising on the patient's needs at each stage. That helped ensure the information flow aligned directly with the patient pathway. When our IT colleagues became distracted by project details, we brought the focus back to patients. What matters isn't what's technologically possible but what's clinically essential.

The trend toward appointing chief medical or nursing information officers in the United States and chief clinical information officers in the UK is essential to strengthen clinical oversight of information projects. These officers help bridge the gap in understanding between the IT and clinical communities. The result is care transformed by data, which drives more proactive interventions and allows outcomes measurement. As we prepare for 2018, we need to see more nurses embrace the challenge of informatics leadership.

Clinical leadership fosters clinical credibility. Disrupting the status quo by asking nurses to change how they work is never easy. But it's far more likely to

## First things first: Assess existing processes

Before we can improve our use of information, we have to acknowledge where we currently get it wrong. When preparing for any change, it's easy to focus on what's new. For nurses consumed with hectic workloads, this is an understandable instinct. But that approach misses the chance to step back and assess existing processes. A poor digitized process is still a poor process.

Instead, the starting point should be to identify how duplicated documents and unnecessary bureaucracy can be removed from the workflow before they're digitized. Such disruptive innovation isn't always popular, but it's essential if technology is to drive transformation.

succeed if led by someone the nursing community respects. To ensure that nursing is key in the transition requires someone who can speak the nurse's language and engage nurses. Ideally, this person should be a nurse. Communication and leadership skills matter more than titles.

### Helping nurses embrace change

Nurses need to be persuaded, not compelled. We need to acknowledge that change can be unsettling. That's why engagement should be at the heart of the process, not an afterthought. Talk of code upgrades will cut little ice on a busy unit. Instead, nurses need to understand how better information will streamline their work, promote more informed decisions, and release more time for them to provide care. Nurses will be more tolerant of bumps in the journey if they know why

they're on the journey and how it will benefit patients.

Visibility is crucial to persuading skeptics to embrace change. Even the best-planned change processes will encounter critics. It may be tempting to defer engaging difficult groups and instead focus initial energies on more persuadable colleagues. But difficult though it is, early engagement is far more effective. Where hostility festers, it grows stronger and risks spreading. Clinical leaders should take the time to understand nurses' concerns, scheduling training early to help allay fears about what's coming.

Establishing simulation units to demonstrate new technology is particularly effective in countering

latent resistance to technology. Nurses who can visualize a change are less afraid of it. Clinical leaders should be a visible presence on units, answering questions and ensuring staff believe their opinions are heard.

Using information to transform the quality of care is a major change for the NHS, but it's clinically essential. Putting information at the heart of care may not be easy, but if we fail to embrace the challenge, we'll fail our patients—and that's not an option. Instead, we have to seize the information agenda and offer the strong clinical leadership it needs. It will succeed only if nurses are clear about what they need and step up to the job of making it happen. That means assuming responsibility for informatics leadership rather than hoping someone else does. We know our jobs better than anyone, and we understand what our patients need. It falls to us to set new standards in the quality of care. ■

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# A Case Study: Using Technology to Build a Culture of Safety

Deb Zimmermann, DNP, RN, NEA-BC

Ten years ago, Virginia Commonwealth University Health System (VCUHS) embarked on a safety journey with a vision of becoming America's safest health system. The goal—zero events of preventable harm to patients, employees, and visitors.

While safety and quality have been an ever-present part of our culture, our focus was on compliance with state, federal, and Joint Commission regulatory standards. We implemented processes to meet core measure requirements, created a falls prevention program, and instituted a rapid response team (RRT). And while we saw each of these succeed, we knew we wanted to achieve more than just regulatory compliance. How could we truly achieve our vision of offering patients the safest health care in the nation?

In 2008, 5 years into our journey, our leadership team determined we needed to accelerate the rate of quality and safety improvement. Instead of thinking vertically, we needed to think

An emphasis on a culture of safety and appropriate use of technology help the organization deliver safer and more efficient health care.

horizontally across all existing programs to create a true culture of safety. VCUHS decided to implement behavioral expectations to prevent errors and manage the organization using a high-reliability performance model—one used successfully by nuclear power plants and air-traffic control systems. To bring our culture of safety to life, we needed a mix of behavioral changes and technical approaches. Every member of our organization from the boardroom to the bedside received education on safety, reliability, effective

teamwork, communication, and collaboration. We believe that by harnessing the knowledge and skills of our people to design safe processes and use technology appropriately, our organization will become more reliable and safer for our patients, team members, and visitors.

## Behavioral changes

VCUHS developed a “Safety First Every Day” behavioral change strategy to challenge all staff to think about safety first—all day, every day. This strategy includes:

- senior leaders' commitment to safety through daily rounding on clinical units and discussions with nurses on safety
- recognition of staff members by the chief executive officer for “everyday” safe behavior and error prevention for preventing harm and reporting near misses. More than 140 employees have been recognized since 2008. Safety star exemplars are displayed on every computer throughout the organization using our screen-saver system, Net Presenter. More than 12,000 employees and physicians have completed training on the principles of safety and how to achieve sustainable improvements. All nurses are specially trained in all aspects of effective teamwork, communication, and relationship management. The nursing professional practice model provides a foundation of shared governance and supports the values of caring, knowledge, leadership, and collaboration.



- 50 clinical nurses serving voluntarily as safety champions and providing peer coaching on use of safe behavioral and error-prevention strategies
- an innovative 15-minute daily conference call that reviews the safety status of more than 30 operational areas of the hospital. In a roll-call format, every area reports on such concerns as patients holding in the emergency department, patient falls, patients in restraints, or patients on suicide precautions. Team-member injuries and blood and body fluid exposures also are reviewed. This 15-minute call keeps leaders connected to frontline operations and focused on safety. Concerns are addressed immediately, and follow-up is reported to the entire health system on the next day's call. Hundreds of staff members participate in this call each day.

### Technical approaches

Technology has played a major role in the ability of VCUHS to provide safer patient care. Every day, more than 2.5 million transactions are processed through our electronic health record (EHR), powered by Cerner. VCUHS nurses have documentation available at their fingertips about a patient's full continuum of care. This saves valuable time and, more important, creates a safer environment because nurses can get timely, accurate patient data from all specialty disciplines across the continuum of care.

Also, recognizing that data must be acted on to achieve better outcomes, we've implemented 653 active EHR alerts to provide clinical-decision support. The system can provide a crosscheck for nurses, warn about a negative medication interaction, or offer guidance that could decrease patient complications.

What's more, VCUHS nurses can view a safety dashboard that identifies high-risk situations or

## Achievements at the 10-year mark

Ten years into our campaign to reach zero events of preventable harm to patients, employees, and visitors, Virginia Commonwealth University Health System (VCUHS) has achieved great results, thanks to safety-behavioral changes and technical approaches. During the past 4 years, VCUHS has:

- reduced mortality by 30% and hospital-acquired infections by 88%
- sustained low rates of hospital-acquired pressure ulcers, restraint use, and falls with injuries
- improved skin integrity rates.

In fact, we've seen statistically significant improvements in all 12 of the key safety themes we measure. We expect results to improve even more as the VCUHS culture of safety continues to grow and thrive.

patients' safety-risk information. Nursing units conduct daily safety huddles and use a safety dashboard as part of their huddles. For all patients on a unit, the dashboard displays on a single screen the key indicators of a patient's care and health status, such as fall risk; need for physical restraints; presence of I.V. lines, urinary catheters, and surgical drains (all of which increase the risk of infection); and any overdue medical orders. With this ability to quickly assess at-risk patients, nurses can intervene before a problem occurs. The dashboard is accessed more than 300 times daily, and the core indicators displayed have demonstrated measurable improvement. For example, we have reduced the rates of patient falls and falls with injuries by 50%. The dashboard has led to organization-wide additional education in deep vein thrombosis, pressure-ulcer reduction, and use of physical restraints.

Perhaps the most exciting example of effective leveraging of technology to improve care is our Medical Early Warning System and Pediatric Early Warning System (MEWS/PEWS). Inspired by one of our critically ill pediatric patients, we recognized the need for our nurses and RRT to have a real-time monitoring system that continuously measures patient acuity and severity. Using information from the EHR, MEWS/PEWS identifies the most

critically ill and decompensating patients and assigns each one a score. Clinicians and the RRT use the information to intervene proactively and escalate care.

The results for the first year are remarkable. The RRT uses the data as its compass to guide prioritization of our sickest patients. The RRT doesn't wait to be called if a patient is in distress. Instead, the team accesses the MEWS/PEWS score on mobile devices and arrives at the bedside to assess and intervene—at times, ahead of the primary team and nurse. Since launching MEWS/PEWS, there has been a 5% reduction in in-house mortality and a 30% reduction in cardiopulmonary arrests outside the intensive care unit. (See *Achievements at the 10-year mark*.)

At VCUHS, we consider it an honor and a privilege to care for the citizens of our community. It's up to us to make sure our work is achieving the outcomes that patients deserve and expect. Clinicians have always worked hard. Now, we work smarter as well, partnering with interprofessional colleagues, technology experts and, most important, patients to provide efficient and effective health care and create healthier populations. ■

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# Technology, transformation, and the nursing workforce

Mark D. Sugrue, RN-BC, CPHIMS, FHIMSS

Introduction of the stethoscope in the 1800s met great resistance among clinicians, who considered it invasive and contrary to current clinical practice. In 1834, *The Times* of London quoted a British physician's opinion of the stethoscope: "That it will ever come into general use, notwithstanding its value, is extremely doubtful because its beneficial application requires much time and gives a good bit of trouble, both to the patient and to the practitioner because its hue and character are foreign and opposed to all our habits and associations."

Today, few clinicians could imagine providing clinical care

**Nursing informatics professionals are ready to lead the transformation to a technology-enabled healthcare environment.**

without the aid of a stethoscope. The tool has become so integrated with their practice that most clinicians consider it part of their standard uniform,

wearing it proudly as a symbol of their knowledge and professional standing. But it's not the tool itself that has transformed clinical practice. Rather, it's the effective use of the stethoscope in the ears of an experienced clinician that can distinguish good sounds from bad and dramatically affect patient outcomes.

Similarly, in the 21st century, health information technology (HIT) has met resistance among some clinicians. Nonetheless, it's fundamentally changing the skills and behaviors required in the workplace. Nowhere is this change more profound than among the 3.1 million nurses, who make up the largest segment of the U.S. healthcare workforce.



## Nursing informatics professionals at the leading edge

Since the earliest days of technology adoption in health care, nursing informatics professionals have been at the forefront of leading change. Early pioneers included nurses who effectively combined the science of nursing with computer and information science to support the clinical workflow, adding value to the organization as they began their journey to join the digital revolution. In 1992, the American Nurses Association formally recognized nursing informatics as a specialty. Since then, the field has grown and the demand for nursing informatics professionals has been increasing at unprecedented rates. Authors of the **2011 Nursing Informatics Workforce Survey** from the Healthcare Information and Management Systems Society (HIMSS) noted that the average salary for nursing informatics professionals was almost 17% higher than it was in 2007 and 42% higher than in 2004.

Today, one of the key roles of nursing informatics professionals—and a role in which they add significant value—relates to clinical transformation. According to the **HIMSS 2011 Clinical Transformation Survey**, “Clinical transformation involves assessing and continually improving the way patient care is delivered at all levels in a care-delivery organization. It occurs when an organization rejects existing practice patterns that deliver inefficient or less effective results and embraces a common goal of patient safety, clinical outcomes, and quality care through process redesign and IT implementation. By effectively blending people, processes, and technology, clinical transformation occurs across facilities, departments, and clinical fields of expertise.”

Experience shows that simply overlaying technology atop existing processes doesn't work. Yet many organizations, in their haste to become more connected or achieve government incentives related to electronic health information, are implementing technology without considering the need to transform clinical practice or the

*Today, one of the key roles of nursing informatics professionals—and a role in which they add significant value—relates to clinical transformation. According to the HIMSS 2011 Clinical Transformation Survey, “Clinical transformation involves assessing and continually improving the way patient care is delivered at all levels in a care-delivery organization.”*

workflow. And in many cases, this is happening without qualified, experienced, and credentialed nursing informatics resources. In organizations lacking a strong workflow and process advocate, the technology may take on a life of its own and begin to lead and inhibit clinical transformation rather than support and enable it. Ultimately, this results in signifi-

cant resistance, workarounds, and unintended consequences.

Nursing informatics professionals also are helping to accelerate the changing skills and behaviors required for the 21st-century nursing workforce. Recognizing the need to adapt to an increasingly rich and technology-enabled environment, a group of nursing informatics leaders formed the **Technology, Informatics, Guiding Education Reform (TIGER) Initiative** in 2006. The goal of TIGER is to better define workforce competencies and effectively interweave evidence and technology into practice, education, and research. In addition to basic computer literacy, TIGER competencies include information literacy and clinical information management competencies for all practice levels. TIGER serves as a valued resource and continues to advance the integration of health informatics to transform practice, education, and consumer engagement.

Without doubt, technology-enabled tools affect every aspect of the nursing process in every care-delivery environment. From clinical documentation systems used to collect and store assessment data to closed-loop medication systems and wireless devices that promote adherence to the six “rights” of medication administration, these changes are occurring in all practice settings (including the patient's home). Nursing informatics professionals stand ready not only to support but also to lead the transformation to a technology-enabled healthcare environment. With the right leadership and the right approach, HIT can achieve its promise and become as integrated into clinical practice as the stethoscope. ■

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# Using technology to make evidence-based staffing assignments

Amy Garcia, MSN, RN, and Kate Nell, MA, RN

As military leaders know, no battle plan survives its first contact in battle; too many variables exist. The same can be said of nurse staffing. In health care, the “first contact” occurs when staff members call in sick and patient numbers or acuity increase or decrease more than planned.

Scheduling and staffing aren't simply a matter of achieving a certain ratio; the cost of mistakes can be measured both in dollars and human lives. Applied technology is improving our ability to assemble real-time, actionable information to support staffing decisions and resource allocation. New evidence-based software computes large amounts of data and applies algorithms that help match the right nurse to the right patient at the right time—and at the right cost. This article describes how nursing leaders are using and benefiting from technology that integrates patient demand, nursing workforce

**Workforce-management software and operational integration help match the right nurse to the right patient at the right time.**

as a resource, and evidence-based practice for staffing.

## Resource-demand management

Catholic Health Initiatives (CHI) has combined technology, business processes, and a collaborative care management strategy to optimize care delivery and manage length-of-stay benchmarks. A national nonprofit health system based in Colorado, it operates nearly 90 hospitals in 18 states. To update each patient's progress continuously, CHI uses a solution with real-time interfaces with the hospital's admissions, discharges, and transfers (ADT); the electronic health record; and concurrent coding systems. As nurses document patient care, acu-

ity is calculated based on the whole patient, including activities of daily living; physical, psychosocial, educational, and perceived needs; and family support. The system automatically calculates the staffing levels and skill mix needed to help the patient progress and adjusts the levels based on ADT activity.

The healthcare team rounds together in the patient room and uses the information obtained to manage the patient's care toward a single departure date and time. Carol Wahl, chief nursing officer (CNO) at CHI's Good Samaritan Health Systems in Kearney, Nebraska, states, “Patient satisfaction has skyrocketed... caregivers report that combining care management with case management is delivering better, more coordinated patient care.”

## Workforce-management solutions

Midland Memorial Hospital (MMH), a not-for-profit hospital serving northwest Texas, uses workforce-management technology to optimize the quality of care and control costs. Centering on a web-based portal for real-time schedule management, the software is fully integrated with human resources, education, and time and attendance data. MMH has automated its scheduling, established self-scheduling practices, and created a fatigue-management guideline. Selected nursing competencies, such as advanced cardiac life support, are visible on the staffing page, alerting nurses to keep their licensure and certifications active. Nurses can self-schedule into an



open slot only if they meet the requirements of that role.

MMH also uses a patient-assignment tool that recognizes the importance of continuity of care. The technology helps nurses and leaders achieve balanced assignments while creating an electronic record of primary and relief assignments. The nurse leader can use drag-and-drop functionality to assign nurses additional duties, such as crash-cart checks, narcotics counts, and refrigerator checks. Transparency of assignments can change nurses' perception of the fairness and equity of those assignments (a key component of nurse satisfaction).

ShiftAlert is an important tool that frees up time for staffing offices and charge nurses, who typically spend hours each day calling nurses to fill gaps in the upcoming shift. This system communicates urgent, short-term staffing needs to qualified staff via text messages, email, and interactive voice response. Using the unit's supporting business processes, ShiftAlert first offers the open shift to nurses qualified to work on that unit who wouldn't be earning overtime or premium pay. The software eases the administrative burden of charge nurses, helping them focus more on patients and staff development.

The technology MMH uses to optimize the workforce and progress of patient care has yielded significant returns. According to CNO Bob Dent, "The improvements in costs were captured in the reduction in and elimination of high-cost labor, such as overtime and agency usage. At MMH, the return on investment for the technology happened within the first year."

### Technology that integrates operations

Florida Hospital System, an integrated system serving central Florida, is installing command centers to serve as operational headquarters where staff can see at a glance

whether patient flow, staffing, and care coordination are operating at equilibrium. "Dashboard" views display bed management, surgery, emergency department, transportation, environmental services, and equipment status simultaneously in real time. Such integration of operations that previously existed in silos helps staff make actionable decisions to maximize operational efficiency and clinical excellence.

Nursing leaders make decisions on staffing resources every day, but determining if those decisions are good ones can pose a challenge. Dan Roberts, associate director for nursing at Stony Brook Medicine, a teaching healthcare system in Long Island, New York, uses technology to inform the following questions: "Did we maximize people, processes, and tools? Did we have the right patient on the right unit with the right plan of care with the right staff doing the right things?" He comments, "These new operational 'rights' of nursing point to access, quality, and cost. If you have these rights as a part of your nursing model, how do you know you have them correct...in real time? These questions are particularly important as governments and payers encourage reductions in length of stay and tie reimbursement to measures of quality and satisfaction."

### Systems that provide real-time staffing information

CHI, MMH, Florida Hospital System, and Stony Brook Medicine use technologies that provide real-time, actionable information on safe staffing. These technologies give nurses transparency about patient acuity, intensity, stability, and progress so they can more easily make assignments that take into account continuity of care, educational and professional characteristics, skill mix, and work environment. Nurses can use reports to predict patients' needs prospectively and can use

shared-governance models to create schedules using systems programmed to account for unit characteristics, union contracts, and labor law. With the aid of this technology, they can fill staffing gaps and understand the financial impact of moment-to-moment decisions. They can link demand for care and hours worked to nursing-sensitive quality measures.

Imagine a future where nursing is reimbursed for the value nurses bring—where nurses have easy access to staffing, patient progress, and financial information; where they maximize technology to clearly establish the relationships between an investment in nursing care and better patient outcomes; where they work with the finance officer to make the right investment. Imagine a future where technology helps us match the right nurse to the right patient at the right time. That future is now. ■

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*Nursing Times* Learning has produced an online learning unit on nursing documentation. "Clinical Record-keeping" features case-based scenarios to help nurses relate their learning to practice, and learners can print out a personalized certificate on successful completion. For more information go to: [www.nursingtimes.net/record-keeping](http://www.nursingtimes.net/record-keeping).