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Electronic Medical Records:
A NURSING PERSPECTIVE

LEARNING TO SUCCEED

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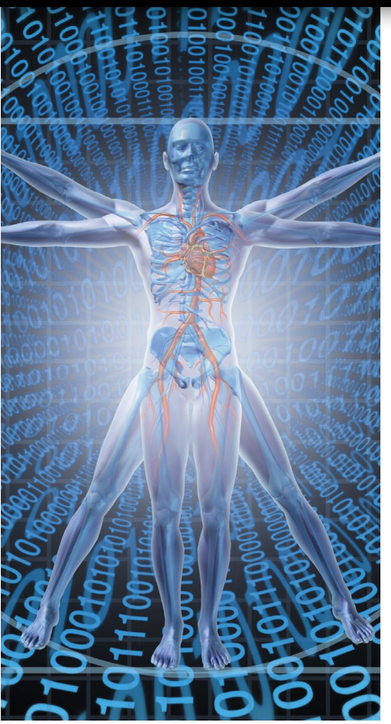

INTRODUCTION

The federal government has taken a strong position on electronic medical records (EMRs), committing unprecedented resources to their wide deployment – and hospitals and physicians practices everywhere are taking note. A survey reported on by Information Week showed that 81 percent of the nation's hospitals and 41 percent of office-based physicians intended to register for federal incentive payments for the adoption and meaningful use of electronic medical record technology.

As a nurse, you'll find that the electronic medical record plays a pivotal role in your daily workflows, the quality of care you deliver, and your hospital's profitability. This guide will serve as an overview to EMR implementation and basic facts that every nurse should be aware of, with links to additional reading materials sprinkled throughout each section.

And if you're interested in planning, implementing, and evaluating information technology initiatives, consider making this field your career specialty. As a first step, you can develop new skills and empower yourself with knowledge through an online MSN degree with a specialization in informatics from American Sentinel University, an innovative, accredited provider of online nursing degrees.

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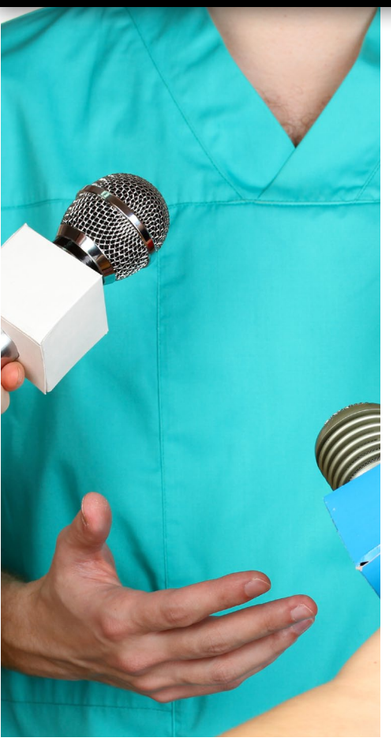
THE GREAT DEBATE: PROS AND CONS



Hundreds of studies have examined the pros and cons of electronic medical records, with varied results. Now that financial incentives are in place to encourage their adoption, however, the debate seems to be effectively over. Disadvantages are no longer likely to be seen as reasons to avoid implementing an EMR, but as challenges to be overcome. Here's a summary of the debate points, from both sides.

Factors that have been considered to be advantages of EMRs

- **Better access to data.** EMRs can provide the ability to quickly transfer complete patient records between departments or across facilities. Clinicians in different locations can have real-time access to scans and lab results as soon as they become available. This accessibility is thought to lead to better care coordination and, therefore, to better outcomes and increased cost savings.
- **More flexible ways to organize and view data.** Paper charts are often fragmented and disorganized. In contrast, electronic records can allow data to be sorted by various parameters , providing customized views of information that is most relevant to various specialists – potentially allowing them to save time or make better clinical decisions.
- **Cost efficiencies gained through data consolidation.** By creating a centralized location for patient info, the EMR may reduce duplication of diagnostic tests or the need for a new provider to take a complete medical history.
- **Reduction of human errors.** These might include the kinds of filing mistakes that make a paper chart unavailable either temporarily or permanently, or errors that result from illegible handwriting.
- **Safety and security.** Electronic records can be backed up off-site or in the cloud, eliminating many of the physical hazards faced by paper records, like fire or water damage. They may also be safer from unauthorized access, due to security tools like encryption, password protection, and automatically generated logs of who accessed the data and when.
- **Smaller storage requirements.** Traditional paper charts can take up an immense amount of space that a medical facility could use for other purposes.
- **Patient safety improvements.** Electronic decision support tools can warn providers of drug interactions, inappropriate dosages, and other potential adverse events that threaten patient safety.
- **Improved management of chronic conditions and better preventive care.** Information on the electronic record can be automatically compared to a database of best practices and medical guidelines, and the system can then alert providers when lab values are out of range, or when a routine screening is indicated. Analysis tools can help providers track progress on quality initiatives across an entire patient population.

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Factors that have been perceived to be disadvantages of EMRs

- **Transitional challenges.** EMRs come with a lengthy implementation process that will disrupt current workflow processes – potentially increasing the risk of errors during the transition period. In addition, providers unfamiliar with technology may have a steep learning curve.
- **High costs.** Start-up and implementation costs are very high, and there are ongoing costs associated with adding IT staff and performing regular system maintenance and upgrades. There is a legitimate fear that these costs may be passed on to patients and payers. Small physician groups, in particular, do not tend to view electronic records as an investment that will pay for itself and many remain unwilling or unable to adopt them.
- **Privacy and security concerns.** Some patients and providers perceive electronic records as more vulnerable to unauthorized use than paper records. While it's true that hackers do exist, most electronic records are fully HIPAA-compliant and capable of keeping data secure.
- **Lack of standardization.** Different systems from different vendors may not be able to share data across platforms. And because technologies evolve rapidly, it may not be possible to achieve standardization for quite some time.
- **Evidence that EMRs do not increase efficiencies.** Many studies have failed to find that EMRs increase operational efficiencies and improve patient outcomes – the Wall Street Journal has reported on two of them here and here. It's possible that the government directives spelling out guidelines for the meaningful use of electronic records will change this in the future.
- **New categories of medical errors.** This is a very real concern and examples have already been seen, including errors that result from overriding alerts, copying and pasting information, posting data in the wrong chart, clicking the wrong checkbox in a list, and miscellaneous software or hardware glitches.
- **Depersonalization.** Clinicians who are used to making handwritten notes have complained about losing the ability to record personal observations and opinions – in the electronic record they are often limited to checking off a box or entering a numerical value (weight, blood pressure, temperature, etc.) In this way, the human element of health care may be lost, as well as opportunities to engage with patients empathetically and compassionately.

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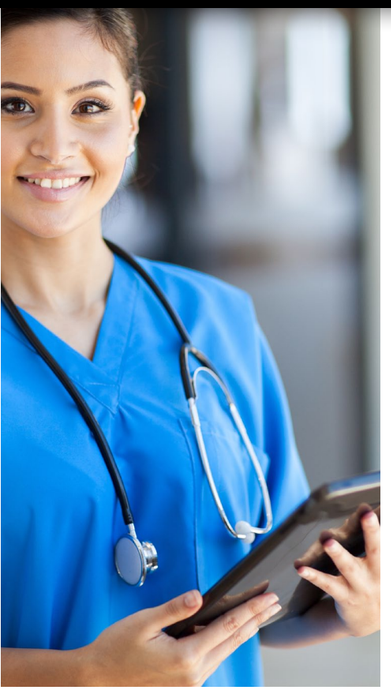
MEANINGFUL USE



Early forms of electronic records were often nothing more than document imaging systems. Providers that used them were merely scanning paper records into a computer, which perhaps contributed to some small gains in efficiency, but did not make use of data in ways that improved overall quality. And that's where the concept of "meaningful use" comes into play.

In 2009, Congress passed the Health Information Technology for Economic and Clinical Health Act (HITECH), as part of a larger economic stimulus package. This piece of legislation seeks to build a solid health information infrastructure, while improving care coordination and creating new jobs to stimulate the economy. Most notably, it gave the health care industry a transformational opportunity to break through the barriers that had been hindering EMR adoption.

HITECH essentially made the stakes for hospitals and physician groups very high, by authorizing incentive payments to those who can demonstrate they are making "meaningful use" of electronic records – that is, employing them in ways that are likely to improve care delivery, according to a set of standards and benchmarks defined by the Centers for Medicare and Medicaid Services (CMS). With 20 billion dollars up for grabs, hospitals can no longer afford to delay the move to electronic records. So the race is on to make sense of the meaningful use requirements and apply them according to a set timeframe.

The timeline for phasing in meaningful use

Meaningful use will evolve in three stages. The goals for each stage are as follows:

◊ **Stage One:** Capture and share data.

◊ **Stage Two:** Advance clinical processes.

◊ **Stage Three:** Improve outcomes.

Each stage also has specific guidelines that have been issued by the federal government, with a tiered approach to increasing the complexity of the way the new technologies are used. Stage One requirements began in 2011. Currently, hospitals and providers are looking ahead to 2014, when Stage Two requirements kick in (this has been moved forward from the original target date of 2013). While the core objectives remain the same in all stages, the requirements become more rigorous. As an example, let's look at the requirements for e-prescribing, usually referred to as computerized provider order entry (CPOE):

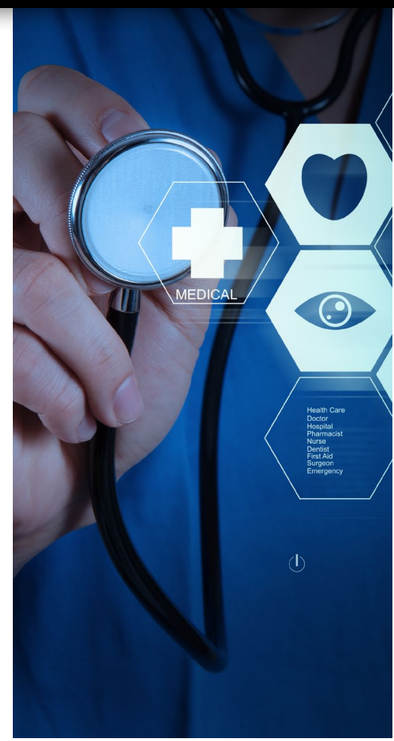
◊ **Stage One:** mandated that CPOE be used for prescribing in 30 percent of all patients taking at least one medication.

◊ **Stage Two:** mandates that CPOE be used to issue at least 60 percent of medication orders, 30 percent of laboratory orders, and 30 percent of radiology orders issued.

You can see that hospitals have a lot of work to do, in order to meet Stage Two requirements. (Click here for a complete comparison of Stage One and Two requirements in all other areas, from transitions of care to making scans and tests available through the EMR.) The final stage, Stage Three, is scheduled for 2016. But it doesn't end there – the government's suggested timeline for meaningful use extends all the way to 2021, when incentive payments will end.

Defining the goals of meaningful use

It's important to remember that meaningful use sets goals that are about health care, not about technology. So, for example, even though the use of CPOE technology is being mandated at a certain level, the idea is that electronic prescribing will make patients safer by preventing adverse drug interactions and medical errors, like those that stem from illegible handwriting on paper prescriptions.



The government has stated that its goals for meaningful use are to use EMR technologies in ways that:

- ◊ Improve the quality, safety, and efficiency of patient care.
- ◊ Reduce health disparities across minorities and income groups.
- ◊ Engage patients and families in their own care.
- ◊ Improve care coordination across providers and facilities.
- ◊ Ensure adequate privacy and security for personal health information.
- ◊ Improve public health, through better prevention and management of chronic conditions like obesity and diabetes.

A brief and very useful table breaks down each of these goals into specific activities, and it's worth taking a look at. Meaningful use becomes a bit more clear when you see that the goal of "engaging patients and families" will be furthered through technology by "providing patients with an electronic copy of their health information (including diagnostic test results, problem list, medication lists, medication allergies), upon request."

How does the EMR and meaningful use affect nurses?

Obviously, a lot has to happen before all providers and hospitals have fully implemented their EMRs and are making meaningful use of them. It's guaranteed to be a complicated process, as workflows are redesigned and integrated into the new normal. At the very least, nurses should recognize that big changes are just ahead. It's likely they'll experience some frustration at the bedside as EMR implementations are rolled out.

For example, it's been reported that hospitals are more challenged by the CPOE requirement than any of the other criteria, according to a study published in the *Journal of the American Informatics Association*. As e-prescribing is adopted gradually, in three stages, let's consider what this system might mean for nurses: Will they have to keep track of both paper orders and digital orders, on two different systems, until the entire transition is made to the electronic system? What if a hospitalized patient is being treated by multiple specialists, some that have adopted CPOE and others that still use paper prescription pads? Will orders be more likely to get lost in the system, or duplicated, during the transitional phase? And what safeguards will nurses have to put in place to detect these transitional errors, and ensure that patients are receiving the right medication at the right time?

When questions like this arise, it becomes clear that nurses, as frontline caregivers, must collaborate with IT departments to keep patients safe and meet the goals of meaningful use. Fortunately, hospital administrators are beginning to realize this.

Due to the influential roles that nurses play in patient outcomes and patient satisfaction scores, hospitals are creating key positions for nurses who will contribute to the IT decision-making process as electronic records are implemented. These nurse informaticians will act as liaisons between clinicians and the IT department, helping to optimize workflows, train bedside nurses in EMR use, and help the IT staff understand technology's impact on patients. In addition, many hospitals are creating a brand new position known as chief nursing information officer (CNIO). So this is another important way in which meaningful use is affecting nurses – it is creating expanded career opportunities for tech-savvy nurses, including the opportunity to move into executive leadership.

PATIENT SAFETY: USING THE EMR TO PREVENT MEDICAL ERRORS

Studies show that only a fraction of medical errors can be pinpointed to the actions of one individual alone. Over and over again, it's been demonstrated that most errors result not from individual carelessness, but from a breakdown in the health care delivery system – in other words, a series of small oversights that might be inconsequential on their own begin to cascade, creating an unfortunate outcome. Often, fragmentation is the culprit – our system is in need of much greater integration between primary care providers, specialists, and ancillary systems like the lab and pharmacy. It's hoped that the EMR can bridge these gaps, by ensuring that everyone is working from the same set of data, and by adding "checkpoint" technologies (barcodes, decision support systems) to existing workflows.

Decision support

Clinical decision support systems will soon be a necessary component of the EMR, in order to satisfy meaningful use requirements. The idea is that these systems can make patients safer, by tracking specific kinds of patient data and generating patient-specific alerts to notify caregivers of potential pitfalls and adverse events. It's also hoped they can improve outcomes by helping practitioners adhere to certain standards of care.

A decision support system combines a library of clinical information with a rules engine that can process how the knowledge is applied to a given situation. Pharmacies have used these systems for quite some time, to check for drug interactions and keep track of patient allergies. More recently, decision support systems have appeared at the point of care. To provide the greatest possible benefit, they should be fully integrated with CPOE and the EMR. Consider this example: the cardiac drug digoxin can cause serious side effects in patients with low potassium levels. So when a physician prescribes digoxin through CPOE, the decision support system automatically checks the electronic record for recent lab tests to make sure potassium levels are normal. If no recent potassium test is found, the system alerts the prescriber that lab work may be needed, in order to avoid an adverse side effect.

Decision support tools are also appearing in nursing workflows. They can process the digitized data in the EMR to notify nurses if a patient is at risk of falls, hearing impaired, has trouble swallowing, etc. – or if there's a required nursing action, like turning a patient to prevent pressure ulcers or filling in missing documentation.

In a best case scenario, alerts can draw attention to tasks that have been missed or are of urgent priority, prevent communication failures as shifts change, and prompt not only action, but reflection as well – which can give caregivers additional opportunities to advocate for their patients.

But decision support is not limited to alerts and reminders. Other kinds of decision support tools can contribute to overall quality, and these include:

◊ **Clinical guidelines.** These can include order sets, care plans, or protocols that encourage correct and efficient care delivery, check the appropriateness of tests ordered, promote evidence-based best practices, and provide management recommendations for various patient situations. There are also tools that provide diagnostic support for complex cases.

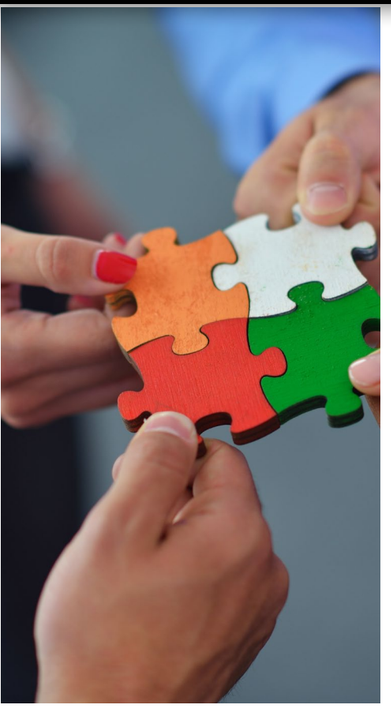
◊ **Patient data reports.** These can include:

- Single-patient reports that filter or sort a patient's information to highlight important management issues, or provide customized views to a certain specialist.
- Multi-patient reports that display activities among all patients on a care unit, which can help clinicians prioritize tasks, make staffing decisions, and keep an eye on the big picture.
- Analytical reports of a large patient population over time, using statistical techniques to measure progress on broad initiatives or calculate risk.

◊ **Documentation templates.** So-called "smart" forms can be customized to emphasize data elements pertinent to the patient's conditions and health care needs. For example, a primary care provider beginning a patient's routine physical might open a template that provides the parameters for recording the details of a general physical exam.

The problem of alert fatigue

A 2009 study published in the Archives of Internal Medicine reported that clinicians writing medication orders overrode up to 91 percent of their drug interaction alerts. The issue stems from a problem that's been dubbed "alert fatigue." It can arise when:



- ◊ The volume of alerts becomes so excessive that providers cancel them out without really paying attention.
- ◊ Providers have learned through experience that most alerts are false positives.
- ◊ The alerts come at a time or in a format that interrupts a workflow or productivity – in other words, they hinder rather than help.
- ◊ Too many alerts are irrelevant to the patient or to standard clinical practice. (Clinicians have actually reported receiving “at risk of falls” alerts for heavily sedated and intubated ICU patients, and “check pregnancy status” alerts for male patients.)

The frustrations associated with alert fatigue can have a profound impact on patient safety, as alerts are basically going unheeded. Since the concept of alert fatigue has become more widely recognized, however, some hospitals are reconfiguring their decision support systems and designing customized rules for when an alert appears, to make sure it is relevant. For example, most decision support systems will trigger an alert if a patient’s creatinine level is high, indicating potential kidney dysfunction. But such an alert might be seen as an annoying time-waster in a dialysis facility, where high creatinine levels are the norm – so it may be advantageous to disable it, rather than creating a situation where providers become programmed to override alerts.

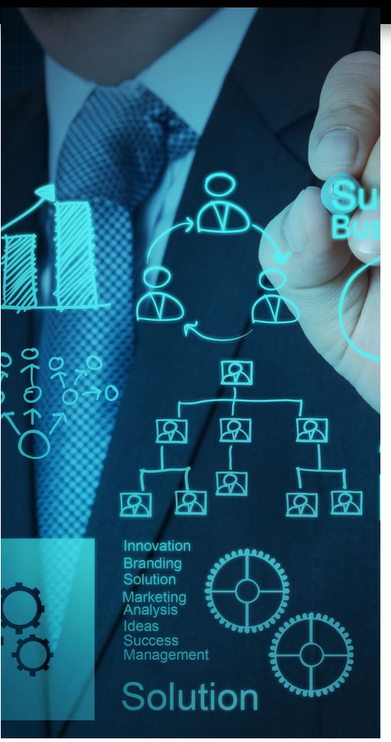
Overall, the industry consensus when it comes to clinical decision support is that the informaticians and programmers who create these systems must aim to improve the specificity of alerts and design alerts in a format that have higher user-acceptance.

Full integration: closing the loop

While CPOE can eliminate the problem of illegible handwriting and pharmacy alerts can screen for potential drug interactions, the key to eliminating medication-related errors is believed to be a “closed loop” system that removes the opportunity for human error at all four stages of the medication process: ordering, transcribing, dispensing, and administering. By 2015, hospitals will have to adopt a closed loop system to meet meaningful use requirements.

With a closed loop approach, the workflow begins with CPOE, which can trigger alerts and reminders to the prescribing physician. The pharmacy’s IT system then verifies the prescription, automatically checking for allergies, contraindications, inappropriate dosages, or duplicate orders. Next, the pharmacist retrieves the medication from an automatic dispensing cabinet, where the medication is dispensed in a single dose and barcoded to match the patient’s ID bracelet. Finally, the nurse who is to administer the medication performs a double check at the bedside, to make sure the barcodes for the medicine and patient correspond. The system automatically adds documentation to the EMR that the medication has been given to the right patient at the right time, and the loop is complete.

LOOKING AHEAD: HEALTH INFORMATION EXCHANGE BETWEEN PROVIDERS



The term “health information exchange” (HIE) refers to sharing clinical data in an electronic format across various health care organizations, according to national standards for encryption and security. The entities that coordinate this sharing of electronic data are also known as health information exchanges, or sometimes as health information organizations – HIOs.

HIE is viewed as the next logical step, as more doctors and hospitals acquire EMRs.

HIE is a forward-looking process; it will take decades to achieve. The goal is to share information regionally or state-wide, and then – eventually – nationally. In the future, it’s hoped that HIE can eliminate boundaries in health care, allowing patient information to flow between hospitals, physician groups, long term care facilities, labs, and even government agencies like local health departments and the CDC. Clinicians will have quick access to test results, as well as a consolidated view of the patient record – all without having to fax or mail paper records. This could prove especially helpful in coordinating care for patients with multiple chronic conditions, and can potentially improve patient outcomes and population health.

Yet despite the perceived conveniences of HIE, the movement is catching on slowly. InformationWeek recently reported on a study that found only 30 percent of hospitals and 10 percent of ambulatory practices belong to HIEs that transmit patient data across separate information systems. The most common type of data exchanged were lab results, discharge summaries, and clinical care summaries – very few providers are exchanging information with public health organizations at this point, to assist in disease tracking and epidemiological studies.

Industry leaders believe that, within our increasingly tech-enabled society, digital communications only makes sense. Health care consumers, particularly the younger ones, are very tech-savvy. They’re used to being able to access their banking data, for example, across locations and devices – and they wonder why their doctors can’t look up their medical history as easily as their bankers can look up financial information. They increasingly don’t accept that they’re asked to provide their medical history over and over again or to come into the office to receive lab test results. (This is starting to change, as more health systems implement patient portals to facilitate communication between the patient and provider.)

There are currently three key forms of health information exchange:

- **Directed exchange** is the ability for care providers to exchange patient information in order to support coordinated care. For example, a primary care physician might send an electronic summary of test results, medications, etc. to a specialist when referring a patient – and the specialist can then communicate the treatment plan and any recommendations for continued care. This type of information exchange can be used to improve transitions of care and make handoffs more seamless. It can also prevent unnecessary duplication of tests, medication errors, and the redundant collection of patient information.
- **Query-based exchange** refers to the ability for providers to search for and locate existing information on a patient. It might be used by emergency room clinicians when a patient is unconscious, or even just unsure of what medications he is currently taking. And it can help ensure patient safety during unplanned episodes of care, like a premature labor and delivery, by making patient information available to providers who aren’t familiar with the case.
- **Consumer-mediated exchange** is the ability for patients to make their own health information available to providers. They might upload data collected through home health monitoring equipment like glucometers, smart scales, and blood pressure devices. Or they might share lab values with a specialist who didn’t order the tests and would otherwise be unaware of the results.

No one knows how quickly HIE will spread, or if it will ever become a widespread industry practice. There are several barriers to HIE adoption. First of all, data privacy and security is a huge concern, in terms of how information it is transmitted and how it is kept safe from unauthorized users. Interoperability is also a problem – currently, EMR systems from different vendors don’t necessarily “talk” to each other. Meaningful use guidelines are addressing the interoperability problem by designating a single, standardized format for communicating summary-of-care records and another standardized format for lab results. But there is a long way to go before patient records are freely shared between providers.

THE EMR TRANSLATES INTO CAREER OPPORTUNITIES

One of the main objectives of the HITECH act was to create jobs, even as it fostered the development of a first-class health information infrastructure. And the frenzy to hire qualified informatics specialists has already begun.

In 2010, a report by the Healthcare Information and Management Systems Society (HIMSS) revealed that two-thirds of health care providers and vendors surveyed had budgeted to add full-time IT staff in 2011. A recent survey by the Hay Group found that 96 percent of respondents had started to create new IT positions and structure new departments, in response to HITECH requirements. Yet interestingly enough, the same survey found that newly formed, full-time, clinical informatics positions are surprisingly difficult to fill. In fact, 47 percent of health care organizations that participated in the survey said they had challenges with recruitment, retention, or both. This indicates that the field is wide open to qualified individuals and that job security will remain strong.

What this means for nurses

For nurses looking to specialize, informatics is a career choice that can put them ahead of the curve in terms of this astounding growth, because their clinical background brings crucial strengths to the field. The Agency for Healthcare Quality and Research reports that the industry is in need of nurses who can analyze technologies from both the bedside and IT perspectives.

As hospitals face the daunting task of implementing electronic records, nurse informaticians will be called upon to use nursing-based knowledge to:

- Manage the transition from paper to digital records in ways that keep patients safe from error.
- Design information systems that are optimized to reflect current, evidence-based standards of nursing care.
- Contribute to initiatives that shape local and federal policy regarding health care IT.
- Develop and implement technological tools outside the realm of the EMR, including disease registries, home care management systems, remote patient monitoring, quality tracking and reporting systems, etc.

Take the first step: become a super-user

The people with a lot of experience in implementing new technologies place a lot of emphasis on identifying what they call a “super-user” – oftentimes a nurse who is naturally tech-savvy, enthusiastic about new tech roll-outs, and well regarded by other staff members. You don’t need a reputation as a geek or a nursing informatics degree to become a super-user, so don’t waste this opportunity! By showing your interest and willingness to get involved, you will definitely stand out as a leader. Super-users help to translate technology into good clinical practice by participating in testing, designing, and training.

Some specific activities you might volunteer for include performing trial runs with potential hardware solutions (laptops, tablets, mobile carts) and giving input; becoming trained on the new system early in the process; and helping to redesign nursing workflow processes to accommodate the new technologies. If you show a lot of aptitude and enjoy the work, you may be asked to help roll-out the new system in other areas of the hospital, or even to help customize order sets within the system.

You may find that becoming a super-user opens the door to a new career specialty in informatics. At some point, online MSN degree in nursing informatics might even become right for you. American Sentinel University is an innovative, accredited provider of online nursing degrees that can help you improve your knowledge, skills, and value to your organization.

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Judy Burckhardt, Ph.D., MAEd, MSN, RN, Dean of Nursing Programs at American Sentinel University discusses why American Sentinel may be the right choice for nurses to go back to school for an advanced degree.

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