

# Charting Nursing's Future

REPORTS THAT CAN INFORM POLICY AND PRACTICE



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- ▶ **Making Technology Work for Health Care: A “Wicked Problem”** ..... 2
- ▶ **EHRs: Fundamentally Changing the Nature of Care** ..... 3
  - Finding the Right Balance ..... 3
  - Great Promise, Only Partially Fulfilled ..... 4
  - Keys to Successful Implementation ..... 4
- ▶ **Alarms: A Classic Case of Unintended Consequences** ..... 5
  - Making a Dent in the Din ..... 5
  - Reducing Alarm Fatigue ..... 5
  - Are Smart Alarms the Answer? ..... 6
- ▶ **Lifting Devices: A Solution in Need of Better Policies** ..... 7
  - The Lifting Conundrum ..... 7
- ▶ **Nursing's Role in Guiding Technological Change** ..... 8

## Boon or Bane? Making Sure Technologies Improve (Not Impede) Nursing Care

Technology—the application of scientific knowledge for practical purposes—played a major role in advancing health care in the last century. But in recent years, the pace of technological change has outstripped the ability of many health care providers to fully reap the benefits or mitigate the challenges that come with these advances. Whether digital, electronic, or mechanical, technological change can be both a boon *and* a bane for patient care.

Nurses, other clinicians, and even patients need to adapt to new technologies, regardless of their limitations, to ensure safe, high-quality care. Too often this has meant finding “work-arounds” that allow clinicians to avoid rather than fix problems that emerge in the care environment.

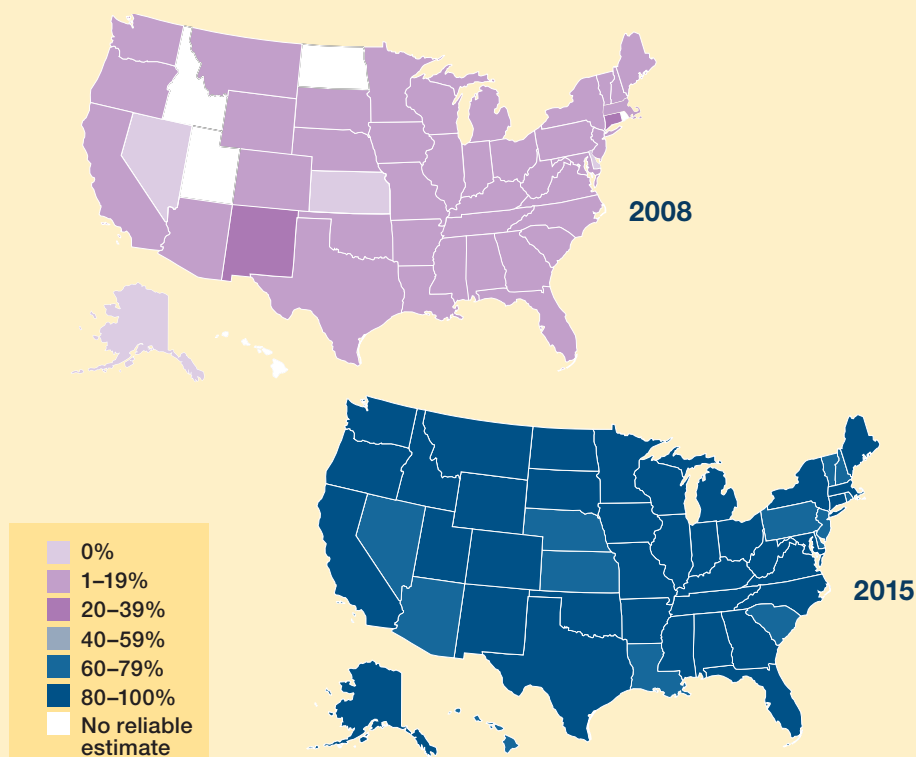
This report explores the challenges associated with three technologies—electronic health records (EHRs), alarms, and lifting devices—that are intended to help nurses and others provide safe and effective care. The report also looks at novel approaches to overcoming these challenges and highlights nursing efforts to ensure that these vital tools help rather than hinder patient care.



*“Technology is never a substitute for clinical judgment or critical thinking. Technology is a tool—an adjunct to nurses’ clinical skills—never a replacement.”*

—Ann Scott Blouin, RN, PhD, FACHE,  
Executive Vice President of Customer  
Relations, The Joint Commission

**Figure 1. Percent of Non-Federal Acute Care Hospitals with EHR Systems by State**



**Source:** Henry J, Pylypchuk Y, Searcy T, Patel V. *Adoption of Electronic Health Record Systems among U.S. Non-Federal Acute Care Hospitals: 2008-2015.* (ONC Data Brief, no. 35.) Washington, DC: Office of the National Coordinator for Health Information Technology; May 2016.

## Making Technology Work for Health Care: A “Wicked Problem”

Whether it's a pedal at the sink to reduce the spread of infection from a handle, a port that allows medicine to enter the body without multiple injections, live-streaming of medical examinations to scribes a continent away, or a computer program that alerts clinicians to potentially fatal drug interactions—there's no question that most health care technologies are key to improving the quality and experience of patient care.

And yet technology and health care are not always natural allies. Technology can be impersonal when implemented on a large scale, while nursing, in particular, is a hands-on profession in which understanding the patient's personal story and tailoring care to the individual is crucial to healing.

This tension is especially evident when technologies are allowed to drive the care experience regardless of whether their use is in a patient's best interest. Consider, for example, an alarm that goes off throughout the night—alerting staff to a known condition that is benign—when what a patient needs most for healing is sleep. Or a mechanical lifting device that frightens a patient and is cumbersome to use. Policies that empower

nurses to rely on their clinical judgment to reset alarm parameters or manually lift patients when appropriate can alleviate such problems and improve the care experience for both patients and clinicians.

Determining how to best integrate technology with health care is the sort of “wicked problem” that two University of California, Berkeley, professors had in mind in the mid-1970s when they coined the term: a problem that involves multiple partners and multiple components, all of which are intertwined—and interdependent—on the others. Resolving wicked problems is difficult because solving one facet of a problem creates ripples that can affect other facets.

In recent years, the adoption of electronic health records (EHRs), which require clinicians to convert their assessments into hundreds of coded entries or fixed numbers on a sliding scale, has further underlined this tension. Administrators want to invest in EHRs to streamline care and develop tracking systems to monitor outcomes. Health information specialists want systems that are accurate and comprehensive in recording processes and outcomes. These are laudable goals, but the resulting systems can be overly complex and burdensome for those on the front lines of care.

“I just want to be able to type a referral and sign it and have it go where I want it to go,” explains nurse practitioner Amy Painter, MSN, FNP, a clinical manager at Children's Healthcare of Atlanta, Ga. “My goal is to take care of my patients quickly, efficiently, and effectively.”

This report explores the challenges associated with three health care technologies and highlights some successful responses—from a ground-breaking



*“Any time you introduce a new technology, there are going to be hiccups. But over time, we figure out how to use it efficiently, and the benefits far*

*outweigh the problems.”*

—Bonnie Westra, PhD, RN, FAAN,  
Associate Professor, University of  
Minnesota School of Nursing, and  
RWJF Executive Nurse Fellow

collaboration aimed at making unwieldy amounts of patient data meaningful in a critical care environment (see p. 4) to nurse-led campaigns to decrease the frequency of nuisance alarms (see p. 6) and make lifting devices universally accessible (see p. 7). It also notes the rise of new nursing roles (see p. 8) that may herald a future in which better policies allow health care technologies to live up to their full potential and become true allies of nursing care.

### Health Information Technology Terms

- **Electronic Health Record (EHR):** A comprehensive digital record containing information generated by all of a patient's health care providers, laboratory tests, imaging studies, etc. EHRs are intended to be accessible and shared by everyone involved in the patient's care.
- **Electronic Medical Record (EMR):** A digital version of the paper medical records used by a single practice or institution, sometimes narrowly focused on an episode of care. The term is gradually being supplanted by EHR.
- **Interoperability:** The ability of different information technology (IT) systems and software applications to communicate, exchange data, and use the information that has been exchanged.
- **The Office of the National Coordinator for Health Technology (ONC):** The chief federal office promoting and supporting the introduction of health IT nationwide; situated within the U.S. Department of Health and Human Services.
- **Meaningful Use:** The ONC umbrella term for the ways EHR technology can improve the quality, safety, and efficiency of care, patient engagement, and population health.
- **Health Informatics:** The interdisciplinary study of the design, development, adoption, and application of IT-based innovations in health care services delivery, management, and planning.



Photo: John Abbott Photography

Today's nurses work in technologically rich environments surrounded by multiple mechanical, digital, and electronic devices.

## EHRs: Fundamentally Changing the Nature of Care

The rapid adoption of electronic health records (EHRs) is one of health care's most remarkable achievements of the 21st century (see Figure 1, p. 1). In 2008 fewer than 10 percent of all hospitals had a basic EHR system. Today—just seven years since the passage of the Health Information Technology for Economic and Clinical Health (HITECH) Act of 2009—some 97 percent of the nation's roughly 5,000 non-federal hospitals have an EHR system in place that meets federal certification standards.

There are many reasons to celebrate the switch from paper to electronic records. Patient charts are no longer lost. There's no need to decipher illegible scrawl. Barcoded prescriptions help ensure that correct doses are given at the correct times, and computerized physician order entry has cut medication errors in half in acute care settings.

EHRs also allow clinicians to easily track a patient's health status over time and alert patients about preventive screenings and changes in that status. And since EHRs make it possible to collect large amounts of

population health data for analysis, and to prompt clinicians to follow best practices, they are a boon to ensuring evidence-based care.

Yet, despite the more than \$35 billion in taxpayer money spent “to promote the adoption and meaningful use of health information technology,” as the HITECH Act prescribed, the introduction of EHRs has also caused frustration among physicians, nurses, and patients who say the technology has changed the nature of health care in unforeseen ways.

### Finding the Right Balance

As with any recordkeeping system, the value of an EHR is predicated on the amount and quality of information stored there, the way that information is organized, and the ease with which it can be retrieved, analyzed, and shared. EHRs represent a huge advance over paper records on all of these fronts, but they also place new demands on providers.

Nurses and physicians find especially burdensome the huge amount of data entry—some of it redundant—that has accompanied the switch to electronic records. The time

required for this task has had several immediate consequences:

- A decline in productivity, forcing clinicians to work longer hours to see the same number of patients.
- An increase in provider stress.
- A de-emphasis on the clinical narrative, with Florence Nightingale's admonition to observe now replaced by recording a series of “yes” or “no” data points.

It wasn't supposed to be like this. A 2010 Institute of Medicine report, *The Future of Nursing: Leading Change, Advancing Health*, predicted that “as routine aspects of care become digitally mediated and increasingly rote, RNs and other clinicians can be expected to shift and expand their focus to more complex and nuanced ‘high-touch’ tasks that these technologies cannot readily or appropriately accomplish.”

Except that someone must still do this “digital mediation.” Overwhelmingly, that falls to nurses, who sometimes feel as though they spend more time documenting their work than they do caring for patients. For some nurses, the demands of electronic documentation have led to intense frustration. For others, the advent of EHRs has vastly improved their experience of providing care (see Voices from the Field, at right).

## Voices from the Field



*“When we were on a paper system, and someone was in the emergency room, information would build the longer they stayed there. So, for example, you're trying to attach an EKG to a*

*chart, and two more traumas come through the door, and you're trying to get the chest pain patient upstairs, and there's a chance—you hate to see it happen—but papers will end up on the wrong chart or pieces of paper will go missing.*

*“With EHRs we don't have to try to chase down the chart—‘Where'd it go? Was it left in x-ray? Does the doctor have it? Does the nurse have it?’ The documentation's clearer. There are definitely some growing pains but, ultimately, to have a unified system where everything's standardized helps continuity of care and patient safety.”*

—**Nick Brewer**, RN, emergency room nurse at Riverside Walter Reed Hospital in Virginia

*“Having managed people in the field, I know the documentation requirement is the number-one complaint. I appreciate that the information is at your fingertips, but what I*

*found is that the incredible amount of time it took to document the information far outweighed the advantages for me.*

*“It takes away very significantly from the time you spend with the patient. Instead the focus is on filling in the data. But if you spend too much time on the computer, patients complain.*

*“The most effective thing I found was to enter the things that needed precision—like vital signs—right away. The rest I left for later.”*

—**Angela Alexander-Knight**, RN-BC, former home health care nurse and manager in New Jersey and New York



*“To make health information technology effective, documentation should have value, workflow should be efficient, training should*

*be adequate, and interdisciplinary collaboration should be front and center.”*

—**Rebecca Freeman**, PhD, RN, PMP, Chief Nursing Officer, Office of the National Coordinator for Health Technology, Department of Health and Human Services, and RWJF Executive Nurse Fellow





## EHRs: Fundamentally Changing the Nature of Care *continued*

### Great Promise, Only Partially Fulfilled

EHRs have already led to improvements in patient outcomes. According to a 2015 [report](#) from the National Patient Safety Foundation, several studies have shown that mortality rates drop at hospitals using advanced EHRs.

Digital health records also promise to make care more patient centered. Imagine a world where patients could easily access their health information and, with the touch of a key, transfer data to a health facility or provider anywhere on the planet. Imagine a world where health records and digital devices could communicate directly with one another, eliminating the need for data entry and the risk of human error.

Yet interoperability, as such seamless data transfer is called, is a largely unfulfilled goal. The \$35 billion federal program that paid hospitals and clinicians' offices financial incentives to adopt EHRs did not specify that different systems should be able to talk to one another. As a result, hundreds of EHR vendors each developed their own proprietary systems. Although the EHR market has consolidated in recent years—six vendors now supply 92 percent of the country's non-federal acute care hospitals—the marketplace remains splintered, with hundreds of other vendors serving the remaining hospitals and ambulatory care venues.

This fragmentation hampers communication between health care providers. While 85 percent of U.S. non-federal acute care

hospitals reported sending EHR data to another provider in 2015, only 38 percent reported using or integrating the data they received—and fewer than half of hospitals had the capability to integrate data into their EHRs without manual entry.

At a minimum, this lack of interoperability creates inefficiency. Evidence suggests it can also do harm. A January 2015 [Harris Poll](#) of 526 fulltime RNs found that half of those surveyed had witnessed medical errors due to a lack of interoperability among different medical devices. The Joint Commission, which accredits hospitals, also [identified](#) health IT as a factor in 120 events resulting in death or serious injury between January 1, 2010, and June 30, 2013. The three most frequent types of negative occurrences involving health IT were medication errors, wrongful surgery (either on the wrong side of the patient, wrong area of the patient, or wrong patient), and delays in treatment. Often the medical error resulted from something as simple as someone making the wrong choice on a drop-down menu, for example, calling for an intramuscular rather than an intravenous injection, or typing in the wrong room number when ordering a chest x-ray for a patient.

To address these and other concerns, the Office of the National Coordinator for Health Technology (ONC) developed the [Federal Health IT Strategic Plan 2015-2020](#), which outlines goals for enhancing the U.S. health IT

### Keys to Successful Implementation

#### Leadership

- Achieve buy-in at the very top.
- Make sure that key constituencies—including nurses—have a seat at the table.
- Put clear decision-making and accountability pathways in place.
- Set realistic implementation timelines.

#### Training and Resources

- Commit sufficient financial resources for training when systems go live and upgrades occur.
- Make sure “super-users,” dedicated IT-focused clinicians, are available.

#### Clinical Content

- Standardize as many elements as possible.
- Focus on evidence-based practices that have real utility, not just theoretical value.

#### Vendor Relations

- Develop lines of communication between users and the EHR vendor.
- Make sure workforce goals and workflow drive system design, not vice versa.

Sources: [Healthcare IT News](#), Office of the National Coordinator for Health Technology

infrastructure and supporting dynamic uses of electronic health information. A key objective is to finalize and implement a nationwide [Interoperability Roadmap](#) to “advance our nation towards an interoperable health IT ecosystem, advance research, and ultimately achieve a learning health system that efficiently and collectively improves health.”

### Johns Hopkins “Emerges” with Software that Enhances Patient Care

EHRs hold reams of information vital to the care of critically ill patients, but the time it takes to sift through that information may be at odds with the swift delivery of care. At Johns Hopkins Medicine, an interprofessional team at the Armstrong Institute for Patient Safety and Quality has created an application that integrates large amounts of data using tablet-based software called “[Emerge](#).” Designed for use in the intensive care unit (ICU), Emerge takes data from the various devices monitoring an individual patient and analyzes the information for five clinical harms: central line bloodstream infections, ventilator-associated events such

as pneumonia, deep venous thrombosis, ICU-acquired weakness, and delirium. The software also alerts clinicians to two social harms: a misalignment of patient and physician goals, and lack of respect and dignity.

According to Rhonda Wyskiel, RN, MSN, a patient safety innovation coordinator at the Armstrong Institute, “Emerge provides a cumulative way of looking at the data, and it translates that information into language that’s visual versus numeric.” The harms monitor, shaped like a wheel, turns red for tasks that need to be done immediately,



Photo: © Human for Gordon & Betty Moore Foundation/ Johns Hopkins Medicine

yellow for tasks that can wait, and green when preventive therapies are complete. The display allows clinicians to grasp—at a glance—what care is most urgently needed.

## Alarms: A Classic Case of Unintended Consequences

Alarms are a classic example of a good idea run amok. Initially used for a small group of high-risk patients, they proved so effective at averting serious complications that their popularity exploded. Today's hospital patients are routinely hooked up to heart monitors, infusion pumps that dispense medications, and pulse oximeters that measure the level of oxygen in the blood—each device equipped with alarms sensitive to small changes in the patient's physiology.

An **estimated** 72 to 99 percent of the resulting alarms are false or non-actionable—they go off because of a problem with the monitoring device, not the patient, or they go off even though there is no clinical problem to address. When a bradycardia alarm intended to catch abnormally slow heart rates wakes up a sleeping patient because her heart rate naturally slows during sleep, or an alarm sounds because an infusion is complete, the ability of alarms to produce a sense of urgency naturally wanes.

Most worrisome is that really important alarms—those that presage a major clinical event—can be drowned out in the cacophony of bells, beeps, and other alerts that typify the hospital soundscape.

One dangerous side effect of all this noise is alarm fatigue—the desensitization of clinicians to alarms caused by too many alarms going off too frequently. Alarm fatigue can easily afflict nurses, and it is now nationally recognized as a serious safety hazard. To deal with alarm fatigue, nurses and others sometimes lower alarm volumes,

silence alarms completely, or simply tune out or ignore the warning sounds. The results can be fatal.

According to The Joint Commission, an **examination** of its Sentinel Event database revealed 98 alarm-related adverse events between 2009 and 2012, of which 80 resulted in death, 13 in permanent harm, and five in unexpected additional care.

Yet trying to respond to every alarm is not the answer either. Reacting to false and non-actionable alarms forces nurses to stop what they are doing to see what's wrong, taking valuable time away from meaningful patient care. Too many alarms are also frightening for patients and families, and can precipitate a stressful “fight or flight” response in those people not used to the din. The noise also undermines hospital efforts to create the sense of calm that recovering patients need.

A well-calibrated alarm rarely cries wolf, but designing an alarm that minimizes false positives requires the right balance between two variables: sensitivity and specificity. An overly sensitive alarm will buzz at the

slightest provocation. An alarm with too little sensitivity will be too specific. It will only buzz if there are dramatic changes in the patient's condition, making it easy to miss early—and potentially life-threatening—physiologic changes.

ECRI, the national nonprofit that looks at ways to improve patient safety and care, put inadequate alarm configuration policies and practices at the top of its **list** of 10 patient safety concerns in 2015. And beginning in January 2014, the Joint Commission **required** hospitals to identify the most important alarms to manage, and to have a systematic, coordinated approach to reduce nuisance alarms in place by January 2016.

### Making a Dent in the Din

At Cleveland Clinic, Anita White, MSN, RN, ACNS-BC, and her colleagues were one step ahead of The Joint Commission mandate. Three years ago, the clinical nurse specialist and alarm expert undertook a study of alarms in Cleveland Clinic's ICUs. She discovered that each specialty—medical, surgical, neuro, coronary, vascular, cardio thoracic, and heart failure—had set different alarm parameters for its patients. Yet when she met with the ICU medical quality directors and clinical nurse specialists, she found they had no treatment plans in place based on the settings they were using. That realization freed everyone to consider making changes.

White and her colleagues began by adjusting their ICU pulse oximeters. They shifted the lower limit from 92 to 90, and turned off each pulse oximeter's heart rate alarm—a duplicate alarm built into the device by the manufacturer.

They also developed a comfort care profile, which prescribed turning off all alarms for dying patients. These measures produced a 7 percent reduction in alarms across all ICUs.

Building on this initial success, the Cleveland team eliminated other duplicate and non-actionable alarms and adjusted alarm parameters for true crises. Today the ICUs are measurably quieter with a 50-60 percent reduction in alarms across all ICUs, and Cleveland Clinic is rolling the alarm reduction initiative out to its satellite facilities. Most importantly, White says, patient safety has not been compromised. She and her colleagues monitored for events and codes, and according to an internal analysis, no reductions in safety occurred as a result of the new protocols.

*Continues next page*

### Reducing Alarm Fatigue

Maria Cvach, DNP, RN, FAAN, is a nationally recognized alarm-management guru and the director of policy management and integration for the Johns Hopkins Health System. She suggests hospitals follow these five steps to curb alarm fatigue.

1. Determine whether the manufacturer's default, pre-set limits are well suited to general and specific patient populations when new equipment is installed. If not, work with medical and engineering staff to define and reset limits.
2. Analyze your organization's alarm data to figure out which alarms are responsible for the greatest number of non-actionable signals. Target specific changes to those alarms.
3. Study your equipment and activate features that reduce nuisance alarms—for example, implement delay settings for ST or SpO2 monitoring that allow an alarm's signal time to auto-correct.
4. Allow customization of alarms for the small proportion of patients whose devices are responsible for a disproportionate percentage of non-actionable alarms.
5. Develop policies and procedures to ensure accountability for setting and adjusting alarms.

## Alarms: A Classic Case of Unintended Consequences *continued*

### Making a Dent in the Din *continued*

Another strategy for reducing nuisance alarms—empowering nurses to customize alarm settings based on each patient's norms—was already in force at Cleveland Clinic. Other hospitals have also found success by introducing short delays that give false alarms time to self-correct before sounding, or by focusing on improving the contact between electrodes and patients' skin, according to a [2013 paper](#) on alarm fatigue by researchers Sue Sendelbach, RN, PhD, CCNS, and Marjorie Funk, RN, PhD, FAAN.

"Perhaps the most effective way to reduce both false and non-actionable alarms," the authors write, "is to avoid unnecessary monitoring and discontinue monitoring when it is no longer clinically indicated."

To succeed in reducing nuisance alarms, it takes a village, says Cleveland Clinic's Nancy Albert, PhD, CCNS, FAAN, the hospital's associate chief nursing officer for research and innovation. "You need to have monitoring technicians and informaticists at

the table; you need the end users—surgeons, anesthesiologists, hospital generalists, and nurses—even environmental services. It takes an interdisciplinary team to consider the multiple issues that lead to too many non-actionable alarms."

The first step in tackling an alarm problem is to define it. And that, says Marilyn Neder Flack, M.A., the Association for the Advancement of Medical Instrumentation's (AAMI) senior vice president, patient safety initiatives, means retrieving the alarm data for each machine and each patient. Cleveland Clinic had that information at hand when White embarked on her study, but many hospitals need to go through their vendors to get it, and at facilities with older equipment, data retrieval can be all but impossible.

"It's a real hurdle," Flack notes. "Any equipment that's, say, 10 years and older, it's hard to get the data out."

Since the Joint Commission's first alarm [directive](#) in 2014, several national initiatives

### Alarm Reduction Resources

- [AAMI Foundation National Coalition for Alarm Management Safety](#)
- AAMI Foundation's [Clinical Alarm Management Compendium](#), which includes 10 Ideas for Safe Alarm Management and sample default parameter settings gleaned from 17 hospitals and health care systems nationwide.
- [NACNS Alarm Fatigue Toolkit](#), which includes a "How Do I Start" checklist.
- American Association of Critical-Care Nurses [Clinical Toolkit: Strategies for Managing Alarm Fatigue](#)

have been developed to help hospitals achieve improved alarm management and patient safety (see box, above).

"Hospitals are no longer alone and don't need to figure this out by themselves," says Flack. "All the guidance they need to succeed has been developed."

### Are Smart Alarms the Answer?

Low blood pressure is not necessarily significant or life-threatening, but when a drop occurs in conjunction with a rapid heart rate, a more serious situation may be afoot.

So-called smart alarms—systems that employ algorithms to analyze the meaning of multiple indicators—are designed to alert clinicians when it really matters, often via customized messages rather than noisy alarms. Smart alarms can also adapt to individuals, "learning" new baselines outside of normal parameters to enable individualized care.

Physician informaticists from Wolters Kluwer Health created a sophisticated electronic sepsis surveillance and alert system that cut sepsis mortality by 53 percent at Huntsville Hospital, a 941-bed tertiary-care teaching hospital in Huntsville, Ala. Readmission rates for patients in the study also fell from 19.1 to 13.2 percent after using the system, POC Advisor.

Four kinds of alerts were delivered to nurses on mobile devices at the point of care:

informational prompts about isolated conditions such as tachycardia or hypothermia; diagnostic alerts that let nurses know about new, positive sepsis screenings; advice alerts with information about evidence-based care for sepsis; and reminder alerts that helped ensure nurses were following a recommended treatment plan.

An algorithm that factored in patient demographics, vital signs, lab results, and coexisting medical problems generated the alerts with both greater sensitivity and specificity than traditional surveillance systems. The study shows how alerts that draw on EHR data and offer decision support enabled nurses to treat sepsis far more promptly than when using conventional detection methods.



Photo: Courtesy of Huntsville Hospital

Prompt treatment is key to controlling sepsis, which kills hundreds of thousands of people every year. Treatment costs are estimated at \$20 billion annually, making it the most expensive medical condition in the U.S., and a leading cause of death.

### For More Information

Manaktala S, Claypool SR. [Evaluating the impact of a computerized surveillance algorithm and decision support system on sepsis mortality](#). *Journal of the American Medical Informatics Association*. Published 25 May 2016.



## Lifting Devices: A Solution in Need of Better Policies

It's one of nursing's most stubborn and protracted problems: back injuries that come from years of moving patients—in their beds, from their beds, and to their beds—and from walking miles along hospital corridors, supporting patients who are taking their first steps after surgery and catching patients when they falter.

For an aging nursing workforce dealing with patients who are sicker and more likely to be obese than in the past, lifting patients is a major concern. According to the Bureau of Labor Statistics, hospital workers develop musculoskeletal disorders from overexertion

at twice the average rate of all fulltime workers, while nursing assistants develop problems from overexertion at more than five times the average overall rate (see Figure 2). It's no wonder many nurses have chronic muscle pain.

### The Lifting Conundrum

For at least three decades, researchers have known that the methods nurses have traditionally been taught for lifting patients were not safe. Body mechanics—bending the knees, lifting with the legs, keeping weight close to the body—may be helpful, but the recommended weight for safe lifting using these techniques is just 35 pounds, less than the weight of a young child.

To reduce the risk of injury, most workplaces have rules in place that require nurses to seek assistance from another staff member before moving a patient. Many facilities have also acquired portable lifts. These battery- or hydraulic-powered devices vary considerably, but typically include cradles, slings, or straps that hang from a metal frame that can be wheeled from room to room.

Many hospitals have instituted guidelines that prohibit manual lifting of patients, and 11

states now have “safe patient handling” laws or regulations on the books. But mandatory rules that require nurses to use lifting devices—without giving them discretion to use their own judgment—can be problematic.

While portable lifts should benefit nurses and others, they have one major drawback: people have to find them to use them. They can also be difficult to push over carpet and through doorjamb, and they frighten some patients. When patients are in distress or have urgent needs, using these devices or even taking the time to locate a fellow staff member to assist with a lift may feel like an inappropriate course of action.

Nurses who do not follow their institutional or state-mandated guidelines can be reprimanded, while nurses who do not acquiesce to patient preferences risk becoming the target of complaints, write

### A Cost-Effective Alternative

At the Mayo Clinic in Jacksonville, Fla., chief nursing officer Debra Harrison, DNP, RN, NEA-BC, had long been concerned about staff injuries. In 2009 she made her case to hospital administrators: lifting injuries in the past four years had cost the then-214-bed teaching hospital an estimated \$1.3 to \$2.7 million. That number included direct costs (e.g. employee medical expenses, wages for lost time); indirect costs (e.g. moving trained ICU nurses to light duty and orienting their replacements who might need months before taking on a full patient load); legal fees and turnover costs; and additional insurance costs, since Mayo self-insures.

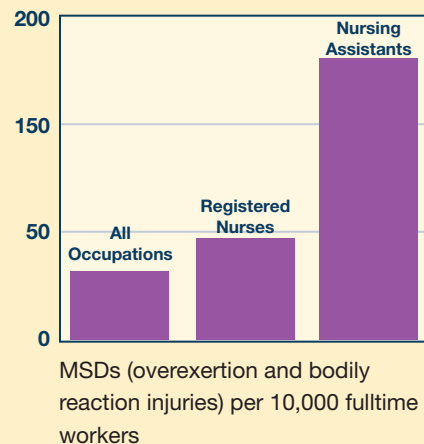
Like almost every other hospital, Mayo had been using portable lift equipment. Armed with detailed financial data about the cost of patient lift injuries, hospital administrators agreed to invest several million dollars to

install ceiling lifts in each patient's room at an estimated cost of \$10,000 per room.

The results were impressive. According to a 2014 [article](#) published by Harrison and other Mayo nurses in the *American Journal of Safe Patient Handling and Movement*, DART (Days Away, Restricted, or Transferred) dropped 44 percent between 2009 and 2012. The number of work-related injuries that the hospital reported to the federal Occupational Safety and Health Administration also fell by 41 percent.

Mayo has policies and procedures in place to help staff use the new equipment, and to give them guidance when patients object to using the lifts. Patient education brochures have also been developed to increase the acceptance of lifts among patients by explaining why they are so beneficial.

**Figure 2. Musculoskeletal Disorder (MSD) Rates by Occupation, 2015**



Source: Bureau of Labor Statistics. *Nonfatal Occupational Injuries and Illnesses Requiring Days Away from Work*. U.S. Department of Labor; 2015: Table 9.

Hans-Peter de Ruiter, PhD, RN, and Joan Liaschenko, PhD, RN, FAAN, in a 2011 [article](#) published in the official journal of the American Association of Occupational Health Nurses. The authors believe that nurses should be given more flexibility to make lifting decisions, and not be shoehorned into following rigid guidelines that are frequently at odds with appropriate clinical judgment.



Photo: Mark Flolo, Medicare Products

“There’s been absolutely no downside whatsoever. It’s been a wonderful thing,” says Mayo Clinic nurse administrator Janice Jacobson, RN, MBA/MSN, NE-BC. “It’s interesting that our new nurses are hearing about it in schools and seeking places to work with a ceiling lift program.”

### For More Information

- NIOSH [Safe Patient Handling and Movement](#)
- [Evidence-Based Practices for Safe Patient Handling and Movement](#). *OJIN*. 2004;9(3).
- [Safe Patient Handling Training for Schools of Nursing](#)

## Nursing's Role in Guiding Technological Change

"We need to step back before we adapt to new technology and have a conversation about how this will impact care," says Carol Huston, MSN, DPA, FAAN, professor emerita at California State University, Chico. "What do we lose by adding this technology? What will we gain? Nurses on the front lines of care 24/7 are the people to figure this out."

Huston foresees continued challenges for nursing as the speed of technological change increases. "Nurses need to make sure that the human element is not lost in the race to expand technology," she *wrote* in *OJIN (The Online Journal of Issues in Nursing)*, and she urges the profession to play a leadership role in preparing for the challenges ahead. To start, Huston would like to see nurses on the technology selection committees in every health care setting, noting that their participation in the selection process is not universally valued.

Roy Simpson, DNP, RN, FAAN, vice president and CNO at Cerner Corp., a major EHR vendor, agrees. "Too often, nurses are not at the table because they are not the user that

drives the organization's revenue." Indeed, observers say insufficient attention to clinical workflows—the actual sequence of different tasks—before installing new technologies prevents them from operating efficiently and is a major contributor to clinician dissatisfaction.

"A lot of technology has come on very rapidly, and we don't always have cleaned-up workflows all the way through discharge," says Rebecca Freeman, PhD, RN, PMP, chief nursing officer at the ONC. "And that's been a little painful."

Ann Scott Blouin, RN, PhD, FACHE, executive vice president of customer relations at The Joint Commission, says nurses need to

"insist...that the best processes for patient care are put in place before new technology is installed. We're frequently told that 'we don't have time for that,' that 'we need to get the technology in; we'll redesign later.' But that may just be automating a bad process," says Blouin.

She shares Huston's concern that the human dimensions of nursing not be overlooked in the race to find technical means to improve care. "Experienced nurses can make finely honed judgments even before the blood gas or CBC (complete blood count) results are in," says Blouin. "'There's something about this patient that's different,' they will say. That's not intuition, that's expertise."

## Technological Change Creates New Roles for Nurses

As new technologies have emerged, so have new nursing roles. These include sales representatives for technical device companies, and health consultants advising consumers on trustworthy health websites and helpful apps.

The growing importance of health IT suggests that it would benefit all nurses to improve their facility with electronic records and devices and gain a basic understanding of health informatics.

One role on the rise is that of *chief nursing information officer* or CNIO. Notes Carol Bickford, PhD, RN-BC, FAAN, a senior policy advisor at the American Nurses Association and an HIMSS Fellow, "There's an increasing importance of the executive-level nurse leader to serve as a translator between the clinical side and the IT shop."

### Pointers for Implementing Technology

- Avoid being enticed by technology for its own sake—and be clear on the precise problem the new technology is designed to solve.
- Research the evidence related to new technologies and engage both experts and frontline users in pre-selection vetting.
- Make sure nurse leaders are represented on the technology and vendor selection committees, and are involved in assessment and design implementation.
- Help establish evaluation criteria and an evaluation process for monitoring the introduction of major technology investments.
- Improve workflow as much as possible before implementation of a new technology, so that the new technology enhances workflow rather than impedes it.
- Take part in testing prototypes in real-life scenarios.
- Build in adequate educational resources to assure a smooth transition.
- Remember that technology is an adjunct to care, not a replacement.

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