

Charting Nursing's Future

A Publication of the Robert Wood Johnson Foundation

Reports on Policies That
Can Transform Patient Care

New Research That Illuminates Policy Issues: Balancing Nursing Costs and Quality of Care for Patients

2006

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This brief is the first issue of *Charting Nursing's Future* to focus exclusively on emerging research that informs nursing policy. The research miniseries will present recent findings and policy implications, highlight research needs and opportunities, and offer a larger context for that research. This issue features research that advances a business case for nursing and shows how investments in nursing affect quality of care for patients.

Experts argue that increased nursing time is associated with better patient outcomes and the reduction of expensive interventions, infections, and patient mortality. Investments in nursing improve staff satisfaction, which in turn increases nurse recruitment and retention, two costly areas for hospitals. This line of reasoning is called the business case for nursing's value.

Figure 1
Number of Adverse Outcomes Averted Yearly
when Proportion of RNs is Raised

OUTCOME	NUMBER AVERTED
Failure to rescue (major surgery pool)	354
Urinary tract infection	40,770
Hospital-acquired pneumonia	11,761
Upper GI bleeding	4,145
Shock or cardiac arrest	2,908
Total avoided adverse outcomes	59,938

Source: "Nurse Staffing in Hospitals: Is There a Business Case for Quality?" by Jack Needleman, Peter I. Buerhaus, Maureen Stewart, Katya Zelevinsky, and Soeren Mattke, *Health Affairs*, January/February 2006.

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The Value of Nursing



One study featured in this brief (see page 4) shows that increasing nursing hours in hospitals can have a dramatic impact on the incidence of expensive adverse outcomes (figure 1, above). Increasing the hours offered by skilled nurses like those pictured on the left is associated with a reduced incidence of pressure ulcers, infections from urinary catheters, and ventilator-associated pneumonia. To do this lifesaving work, nurses need to spend time caring for their patients, not walking miles to gather supplies or medication or doing unnecessary paperwork.

Nursing's Impact on Quality of Care

While Americans are often used to thinking that they have the best health care system in the world, data gathered by the Institute of Medicine (IOM) tells a different story:

- Between 44,000 and 98,000 Americans die from medical errors annually.
- The United States exceeds other industrialized countries in health spending, yet American life expectancy lags behind that of other nations.
- Medication-related errors in hospitals cost roughly \$2 billion annually.

The IOM has issued a series of reports that document health care's failure to ensure patient safety and quality care, including *To Err Is Human: Building a Safer Health System*, *Crossing the Quality Chasm: A New Health System for the 21st Century*, *Keeping Patients Safe: Transforming the Work Environment of Nurses*, and the *Pathways to Quality Health Care* series. This body of work has compellingly documented the ways in which the American health care system falls short. (Full citations appear on page 8.)

“Nurses are the early detection system for complications and errors. Patient survival improves and fewer adverse events occur when hospitals have educated nurses, adequate staffing, and good communication between the interdisciplinary team and management.”

Linda Aiken, PhD, FAAN, FRCN, RN, Claire M. Fagin professor of nursing and sociology and director of the Center for Health Outcomes and Policy Research, University of Pennsylvania



Lapses in quality of care are expensive for hospitals and society: litigation, longer stays, more intensive nursing, further treatments, and more medication can all result from errors and inadequate attention.

“Nurses can have a significant impact on quality and safety,” says Lillie Gelinas, MSN, FAAN, RN, vice president and chief nursing officer of VHA Inc. “And we’ve reached a point where excuses don’t work any longer. Research defines a correlation between nurse staffing and clinical outcomes. Once that data is publically reported, Americans won’t tolerate the unsafe system that exists much longer.”

The costs and value of nursing have been documented in earlier studies authored by Linda Aiken, PhD, FAAN, FRCN, RN. Aiken has found that surgical patients in hospitals had higher mortality and failure-to-rescue rates when their nurses were responsible for a higher number of patients, and that nurses in such hospitals are more likely to experience burnout and job dissatisfaction. Aiken has shown the steep human and monetary costs of asking nurses to care for too many patients. Two recent studies offer research findings that advance the business case for nursing and offer further evidence of nursing’s value.

In “Improving Nurse-to-Patient Staffing Ratios as a Cost-Effective Safety Intervention,” Michael B. Rothberg and his coauthors investigate the cost of nursing compared to other interventions whose costs are routinely accepted.

In “Nurse Staffing in Hospitals: Is There a Business Case for Quality?” Jack Needleman and his coauthors compare the costs and benefits of different ratios of nurses to patients.

This brief offers summaries of these two new studies along with information about how to further develop the business case and understand implications for policy.

What the Research Suggests for Policy

Create incentives that encourage hospitals to design work environments or processes that allow nurses to spend more time caring for patients. Hospitals are trying a range of innovations: sharing governance so that nurses contribute to the policies of the institution, creating more efficient charting systems, and storing supplies in patients’ rooms or creating more efficient record-keeping systems.

Fund research that allows decision makers to make more informed choices about the real costs and impacts of nursing. The field needs a better evidence base, yet funding opportunities for relevant research are relatively limited.

Revise regulations that can impede safe patient care. Acuity-adaptable beds can allow a patient to stay in one room throughout a hospital stay, sparing the patient multiple transfers and potential falls, errors, and treatment omissions. But the Centers for Medicare and Medicaid Services won’t allow a hospital to bill two levels of care for the same bed, a policy that could be revised to make care safer and more efficient.

Provide targeted staffing supplements or increase payments to hospitals that increase nurse staffing. There is a precedent for this: in 1965, Congress included extra payments to hospitals to help them raise wages and increase staffing in response to the new Medicare system.

Support measures that strengthen the pool of future RNs and improve RN education. The Kansas legislature recently committed to a ten-year, \$30 million initiative that will grant funds for nurse educator scholarships and facility and equipment upgrades. Legislators expect the initiative to expand the state’s nursing education capacity by 25 percent.

Viewing Nursing Costs in the Context of Accepted Interventions

FEATURED RESEARCH

“Improving Nurse-to-Patient Staffing Ratios as a Cost-Effective Safety Intervention”

Medical doctors tend not to weigh in on nurse staffing: they often see nursing as an administrative issue that is outside their set of concerns. In a recent study, Michael B. Rothberg, MD, an internist, offers a doctor’s perspective on nursing’s impact on quality of care.

Rothberg and his coauthors argue that it is important to recast the nursing shortage as a patient safety issue and illustrate how inadequate nurse staffing adversely affects the work of doctors and the outcomes that they can expect for their patients. The researchers analyzed a number of scenarios to find which nurse-to-patient ratios were associated with reduced mortality and fell within the cost range usually considered acceptable for patient safety interventions.



“Physicians, hospital administrators, and the public must now begin to see safe nurse staffing levels in the same light as other patient safety measures.”

Michael B. Rothberg, MD, associate medical director for quality, division of healthcare quality, Baystate Medical Center

The Link between Nurse Staffing and Patient Outcomes

Many hospitals have responded to the ongoing crisis in health care spending by asking nurses to care for more patients, among other cost-saving measures. The article cites the growing body of research that links nurse staffing to patient outcomes. For example, in *Health Care at the Crossroads*, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO) found that 24 percent of 1,609 unanticipated events that resulted in injury, death, or permanent loss of function were related to inadequate nurse staffing levels.

These findings led Rothberg and his coauthors to analyze cost-effectiveness from the institutional perspective by comparing patient-to-nurse ratios ranging from 8:1 to 4:1 to interventions that are considered cost-effective and good for patients. They drew mortality estimates from the 2002 study by Aiken et al. published in the *Journal of the American Medical Association* and cost estimates from the medical literature and from the Bureau of Labor Statistics.

The Cost of Saving Lives

Rothberg et al. found that nurses affect length of stay by preventing adverse events, which tend to be expensive.

The researchers found that eight patients per nurse was the least expensive ratio but was associated with the highest patient mortality. Decreasing the number of patients each nurse cared for reduced mortality and increased costs.

According to Rothberg et al., considering labor costs only and excluding savings from decreased length of stay, the cost of changing from five to four patients per nurse is \$142,000 per life saved. Lower ratios were most cost-effective when they shortened patients’ length of stay and when hourly wages were low, but even assuming the least financially advantageous conditions, the incremental cost of limiting the ratio to 4:1 never exceeded \$449,000 per life saved—well within a reasonable cost range.

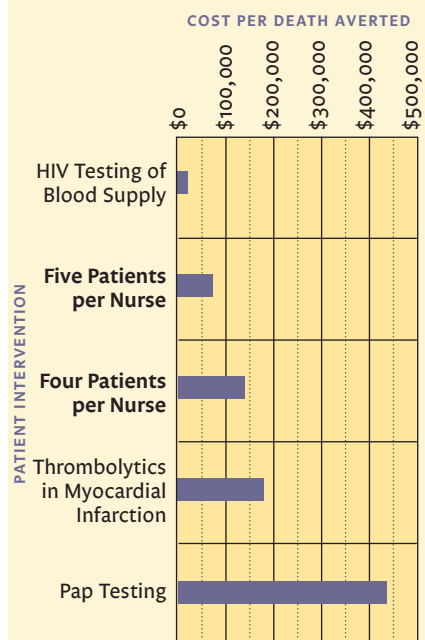
Nurse Staffing Costs Compared to Other Interventions

Rothberg compares the costs of saving lives (see figure 2):

- The cost of changing from a patient-to-nurse ratio of 5:1 to 4:1 is estimated at \$142,000 per life saved.
- Thrombolytic therapy in acute myocardial infarction costs \$182,000 per life saved.
- The cost of routine cervical cancer screening via Pap smears costs \$432,000 per life saved.

“Considered as a patient safety intervention, improved nurse staffing has a cost-effectiveness that falls comfortably within the range of other widely accepted interventions,” say the researchers. “If a hospital decided, for economic reasons, not to provide thrombolytic therapy in acute myocardial infarction, physicians would likely refuse to admit to that hospital, and patients would fear to go there. Physicians, hospital administrators, and the public must now begin to see safe nurse staffing levels in the same light as other accepted patient safety measures.”

Figure 2
The Cost of Lower Patient-to-Nurse Ratios Compared to Widely Accepted Lifesaving Interventions



Source: “Improving Nurse-to-Patient Staffing Ratios as a Cost-Effective Safety Intervention,” Michael B. Rothberg, Ivo Abraham, Peter K. Lindenauer, and David N. Rose. *Medical Care* 43, no. 8 (August 2005).

FEATURED RESEARCH

“Nurse Staffing in Hospitals: Is There a Business Case for Quality?”

Jack Needleman and his coauthors construct national estimates of the cost of increasing hospital nurse staffing when weighed against the reduction of days in hospital, deaths, and adverse outcomes.

Three Options to Increase Nurse Staffing

The researchers took the 799-hospital sample that they studied in an earlier article and projected the results from the sample to all nonfederal U.S. acute care hospitals. They also updated the estimates of needed staffing, avoided adverse outcomes and patient days in the hospital, and costs to reflect hospital costs, admissions, and lengths-of-stay in 2002, when U.S. short-term acute general hospitals employed 942,000 full-time equivalent (FTE) RNs and 120,000 FTE LPNs. The article discusses the effects of increasing the proportion of RNs and/or the hours worked by all licensed nurses to the 75th percentile.

The researchers explored three specific options to increase nurse staffing (figure 3):

- **Option one:** Raise the proportion of registered nurses among licensed nursing staff (registered nurses and licensed practical nurses) to the 75th percentile without changing the total hours worked by licensed nurses.
- **Option two:** Raise the number of hours worked by registered nurses and licensed practical nurses to the 75th percentile of hospitals studied without changing the proportion that are RNs.
- **Option three:** Raise both the proportion of RNs and the number of hours worked by licensed nurses to the 75th percentile of hospitals studied.



“Costs are only part of the picture; we also need to consider the payoff in cost savings and the value of better patient care.”

Jack Needleman, PhD, associate professor, department of health services, School of Public Health, University of California, Los Angeles (UCLA)

Reducing Days and Complications

The investigators found that raising the proportion of nursing hours provided by registered nurses without increasing total nursing hours (option one) is associated with a net reduction in costs.

They also found that increasing licensed nursing hours (with or without increasing the proportion of hours provided by RNs) is associated with decreased length of stay, fewer adverse outcomes, and fewer patient deaths, at a net increase in annual hospital expenditures of only about 1.5 percent. If fixed costs are recovered or reallocated to other revenue-producing activities, the net cost increase would only be half a percent.

Failure to rescue among surgical patients appeared to be especially sensitive to the number of licensed hours per day. On the other hand, decreases in urinary tract infections, pneumonia, and shock or cardiac arrest were associated most with increasing the proportion of RNs in particular, probably because preventing these complications draws heavily on the skills and education of RNs in patient assessment and intervention, not just increased time to observe and treat patients.

Needleman et al. argue, “There is an unequivocal business case for hospitals to improve nurse staffing under one option we examine: raising the proportion of RNs without changing licensed hours [option one]. This option was also the least costly—\$811 million—and would achieve a net reduction in short-term costs of \$242 million.”

Other Factors Need More Study

Needleman and his colleagues point out that they considered cost offsets in their study, but that there are other important consequences of care that they haven't yet explored. Ultimately, they say, the business case for nursing should also take into account other cost-reducing factors such as the following:

- the economic value to hospitals of lowering liability by reducing adverse nursing-related morbidity and mortality;
- the economic value to hospitals of reduced nurse turnover;
- the economic value to hospitals of positive outcomes associated with higher nurse staffing levels documented in other studies, such as fewer patient falls, blood-borne infections, decubitus ulcers, and medication errors; increased patient satisfaction; good discharge planning; and increased ability of patients to perform self-care.

Needleman and his colleagues also note that hospitals with reputations for good nursing care associated with higher staffing may attract more patients.

They also argue that while only option one generates cost savings, the value to patients and their families of reduced risk of death, decreased pain and suffering, and fewer lost days of work may justify the modest cost increases associated with options two and three.

Implications for Policy

Importantly, Needleman et al. note that competing interests need to be balanced. The investigators point out that cost savings from increased staffing may not necessarily help a hospital. Depending on the system of reimbursement, a reduction in a patient’s length of stay may be valuable to a payer, but not financially beneficial to a hospital.

Policy makers and public and private payers could help to resolve these conflicts by providing targeted staffing supplements or increasing payments to hospitals that increase

nurse staffing. There is a precedent for this: in 1965, Congress included extra payments to hospitals to help them raise wages and increase staffing in response to the new Medicare system.

According to Needleman, where there is not a clear business case for increased nurse staffing, there may be a “social case” that would be an appropriate focus for policy intervention. From a patient’s perspective, the additional costs of increased nurse staffing seem clearly justified.



“Quality nursing care does prevent bad things from happening to patients, but it’s hard to measure what doesn’t happen.”

Jerod M. Loeb, PhD, executive vice president for research, Joint Commission on Accreditation of Healthcare Organizations

Needleman et al. argue, “There is an unequivocal business case for hospitals to improve nurse staffing under one option we examine: raising the proportion of RNs without changing licensed hours [option one]. This option was also the least costly—\$811 million—and would achieve a net reduction in short-term costs of \$242 million.”

Figure 3
Projected Results of Three Different Nurse Staffing Options

	Option 1 Raise proportion of RNs to 75th percentile without changing the total hours worked by licensed nurses (RNs and LPNs)	Option 2 Raise number of licensed hours to 75th percentile without changing proportion of RNs	Option 3 Raise both proportion of RNs and number of licensed hours to 75th percentile
Results			
Avoided adverse outcomes	59,938	10,813	70,416
Avoided hospital days	1,507,493	2,598,339	4,106,315
Avoided deaths	4,997	1,801	6,754
Cost savings assuming that 40% of hospital costs are variable (in millions)			
Cost savings of avoided outcomes	\$ 73	\$ 17	\$ 89
Cost savings of avoided days	\$ 980	\$ 1,702	\$ 2,683
Total avoided costs	\$ 1,053	\$ 1,719	\$ 2,772
Net cost of increasing nursing	\$ -242	\$ 5,819	\$ 5,716
Net cost as percent of hospital expenses	-0.1%	1.5%	1.4%
Cost savings assuming that fixed hospital costs are recovered (in millions)			
Cost savings of avoided outcomes	\$ 183	\$ 42	\$ 224
Cost savings of avoided days	\$ 2,450	\$ 4,256	\$ 6,707
Total avoided costs	\$ 2,633	\$ 4,298	\$ 6,930
Net cost of increasing nursing	\$ -1,821	\$ 3,240	\$ 1,558
Net cost as percent of hospital expenses	-0.5%	0.8%	0.4%

Source: “Nurse Staffing in Hospitals: Is There a Business Case for Quality?” by J. Needleman, P. I. Buerhaus, M. Stewart, K. Zelevinsky, and S. Matke, *Health Affairs* (January/February 2006). Authors’ estimates using data from J. Needleman et al., “Nurse Staffing Levels and Quality of Care in Hospitals,” *New England Journal of Medicine* 346, no. 22 (2002): 1415–22, updated to 2002 based on 1997 and 2002 American Hospital Association annual survey data and on wage data for nurses employed in hospitals from the Current Population Survey.

Transforming Care at the Bedside (TCAB) is a national program to improve the quality and safety of patient care and increase retention of experienced nurses. Supported by the Robert Wood Johnson Foundation in collaboration with the Institute for Healthcare Improvement (IHI), TCAB empowers nurses to make needed changes in bedside care, guided by the insights of patients and their families.

Many of the TCAB hospitals have found that improving bedside nursing and the nursing work environment also has a positive impact on the bottom line, according to Tamra E. Merryman, RN, MSN, FACHE, vice president, Center for Quality Improvement and Innovation, University of Pittsburgh Medical Center (UPMC).

When TCAB unit nurses come to work at UPMC Shadyside, they pick up a noncellular personal phone and check into a messaging service that allows them to retrieve stored histories and recent clinical information about patients, hear messages and reminders from the nurse manager, and receive admission reports from physicians in the emergency department. The personal phones and messaging system save nurses twenty-eight minutes each per shift and return \$687,000 worth of nurses' time to patients' care in a year.

Rather than forcing nurses to spend their valuable time "hunting and gathering" supplies, the unit now stores supplies that nurses need in patients' rooms. This small change saves every nurse about eighteen minutes a day and saves the hospital \$400,000 a year, says Merryman. Decision makers may suspect that storing supplies in patient rooms could lead to wasteful use and higher supply costs, but UPMC Shadyside has not seen this trend so far. And according to Merryman, the costs of supplies are trivial when compared to the risk of losing nurses because of physical exhaustion, injuries, dissatisfaction, and burnout.



Photo: Evelyn Pierce

The Value of Nursing

Nurses work to keep a patient from going into crisis. Only about 20 percent of patients who are resuscitated survive to go home, so it is crucial that nurses are available at patients' bedside to assess and address patient conditions before they deteriorate to crisis levels.

By redesigning systems, the TCAB unit at UPMC Shadyside has significantly improved the working lives of frontline nurses and allowed them to spend more time with patients. The unit has also saved \$1.5 million in nurses' time that would have otherwise been lost to inefficiency.

The TCAB initiative creates change in four ways:

Providing safe and reliable care for patients.

Research suggests that most errors in hospitals—70 to 90 percent—occur as a result of system failures, not staff behavior. TCAB sites implement a number of known and tested best practices to improve reliability and help prevent system failures in medical/surgical units. For example, rapid response teams intervene when patients' conditions are deteriorating but before they reach crisis.

Creating a satisfying and supportive workplace.

Nursing shortages and high turnover create strain on staff and erode continuity of care. Nurse turnover is also expensive: it costs \$50,000 to \$65,000 per position to hire and bring a nurse up to speed. TCAB sites engage in a range of practices that improve work environments and keep nurses with patients. For example, nurses use a traffic-light system to indicate when they are available to care for additional patients, an inno-

vation that respects nurses' judgment and enhances teamwork.

Delivering patient-centered care.

A central principle of TCAB is that effective health care honors the whole patient and family, respects individual values and choices, and ensures continuity of care. TCAB nurses work with patients and families to establish patient preferences and daily goals (e.g., walking a certain distance or eating a full meal). Goals are shared on large white boards in patients' rooms, where families can also add questions or notes. Such strategies engage everyone—care team, patients, and families—in the care process.

Increasing the time nurses spend at the bedside.

TCAB sites redesign work processes and reconfigure physical spaces to allow nurses more time for direct care. Increasing available nurse hours by as little as thirty minutes per patient day can have an impact on patient health: 4.5 percent decrease in urinary tract infection, 4.2 percent decrease in pneumonia, 2.6 percent decrease in thrombosis, and 1.8 percent decrease in pulmonary damage, according to an article by C. Kovner and P. J. Gergen published in *Image: Journal of Nursing Scholarship*.

For More Information about TCAB

• www.ihi.org/IHI/Programs/TransformingCareAtTheBedside

Research on Measuring the Value of Nursing

Experts consistently call for researchers to expand the evidence base connecting nursing and quality and cost of care. Some interesting initiatives are underway.

Measurement Challenges

Not enough is known about nursing's impact, and there has been little consensus about how to measure the contributions that nurses make. Yet studies show that the work of nurses keeps patients from developing adverse conditions. Other positive correlations are likely but hard to prove because "Quality nursing care does prevent bad things from happening to patients, but it's hard to measure what doesn't happen," says Jerod M. Loeb, PhD, executive vice president for research for JCAHO. In addition, he says, the roles that nurses play and the work that they do varies widely depending on the unit that they work in, their specialties, and the acuity of their patients on a given shift.

Nursing-Sensitive Standards

To begin to address this gap in knowledge and to promote the highest level of patient safety and health care outcomes in acute care hospitals, the National Quality Forum (NQF) established national voluntary consensus

standards for health care processes and outcomes that reflect the care that nurses provide.¹

According to NQF, these standards "provide consumers a way to assess the quality of nurses' contributions to inpatient hospital care, and they enable providers to identify critical outcomes and processes of care for continuous improvement." The standards can also be used by purchasers to reward hospitals that have higher performing nursing service. Another benefit is that these standards offer researchers a consistent nomenclature for research studies, according to Ellen T. Kurtzman, RN, MPH, senior program director, NQF.

There are eight standards that focus on patient-centered outcomes affected by nursing care:

- death among surgical patients with treatable serious complications (known as failure to rescue),
- pressure ulcer prevalence,
- falls prevalence,
- falls with injuries,
- vest and limb restraint prevalence,
- urinary catheter-associated urinary tract infections for ICU unit,
- central line catheter-associated blood stream infection rate for ICU and high-risk nursery (HRN) patients,

- ventilator-associated pneumonia for ICU and HRN patients.

There are three standards for nursing-centered interventions, focused on nurses providing smoking cessation counseling for patients with acute myocardial infarction, heart failure, and pneumonia.

And finally, there are four standards to evaluate the system in which nurses work:

- skill mix of nurses (RN, LPN, and other),
- nursing care hours per patient day,
- practice environment scale,
- voluntary turnover.

Implementing Standards

JCAHO recently released an implementation guide for institutions that want to use the NQF measures. The guide consolidates individual measure specifications, presents them in uniform formats, and provides a data dictionary and glossary of terms.²

Work Environment as a Factor

Other experts argue that the environment that nurses work in has an impact on what they are able to accomplish, how effective their care of patients will be, how satisfied they will be on the job, and how expensive nursing care will be.

Ann Hendrich, RN, MSN, FAAN, vice president of clinical excellence operations at Ascension Health, has completed time and motion studies and initiated a national demonstration nursing unit that showed how less than 20–30 percent of the budgeted nursing hours per patient day were spent delivering direct care. Nurses spent up to 50 percent of their time documenting aspects of care and often walked miles during their shifts. Most nursing time is taken up with indirect, non-value added "hunting and gathering" of equipment, supplies, and information. When hospitals improve the work environment and work processes for nurses, they can also be more cost-effective while offering more care to patients.

The Value of Nursing



Photo: Getty Images

Nurses, accompanied by a physician, transport a patient so that he can receive lifesaving care. Nurses are crucial to the quality of care that patients receive. Patients have better outcomes with lower costs when they have adequate nursing care. Experts argue that the cost of increasing nursing hours to adequate levels is reasonable and may even represent a savings.

A current study led by Hendrich and Marilyn Chow, DNSc, RN, vice president, Patient Care Services at Kaiser Permanente, will further document the ways in which medical-surgical nurses spend their time in order to argue for evidence-based design of nursing units. The study will collect data using several methods:

- personal digital assistants (PDAs) programmed to enable nurses to self-report activities randomly measured during their shift,
- Radio Frequency Identification (RFID) tags to track nurses' movements during a shift,
- an armband that measures the physical impact of workload and stress by tracking the physiological variables of heat flux, galvanic skin response, skin temperature, calories burned per minute, and peak activity levels nurses burn during a shift.

Preliminary results from the study are coming in and much of the analysis will be complete by the end of 2006.

Cultivating Research on the Impact of Nursing

The Interdisciplinary Nursing Quality Research Initiative (INQRI) of the Robert Wood Johnson Foundation also promises to add substantially to what is known about the impact of nursing.

INQRI supports research that advances understanding in several key areas:

- the nursing process, workforce, and environment and how innovation affects quality of patient care;

- structural, organizational, and environmental factors that affect quality of nursing in acute care;
- accurate, useful, feasible measurement of the quality of nursing care;
- methods to credibly estimate the improvement in nursing and patient outcomes that can be attributed to improvements in the nursing workplace or workforce;
- challenges that affect the conduct of research related to the quality of nursing care;
- facilitators and barriers to the successful adoption of research findings to improve nursing care.

The INQRI Web site offers details about the initiative and provides easy access to several papers produced for the National Quality Forum: www.inqri.org.

This emerging field of study will help further develop an evidence-based business case for nursing.

The research trends discussed in this brief are a beginning, but important questions remain to be answered. Will hospitals that already track hundreds of measures willingly add nurse-sensitive measures? Will JCAHO and the Centers for Medicare and Medicaid Services use nurse-sensitive measures in regulating health care organizations? Will patients choose institutions that have better outcomes?

1. The standards are available from NQF at www.qualityforum.org/txNCFINALpublic.pdf
2. The guide is available from JCAHO, visit: www.jointcommission.org/PerformanceMeasurement, in left menu, choose "Joint Commission Measure Reserve Library," then choose "Quality Forum (NQF)."

Research Highlighted in This Brief

Needleman, J., P. I. Buerhaus, M. Stewart, K. Zelevinsky, and S. Mattke. "Nurse Staffing in Hospitals: Is There a Business Case for Quality?" *Health Affairs* (January/February 2006).

Rothberg, M. B., I. Abraham, P. K. Lindenauer, and D. N. Rose. "Improving Nurse-to-Patient Staffing Ratios as a Cost-Effective Safety Intervention," *Medical Care* 43, no. 8 (August 2005).

Other Relevant Scholarship

Aiken, L. H., S. P. Clarke, D. M. Sloane, J. Sochalski, and J. H. Silner. "Hospital Nurse Staffing and Patient Mortality, Nurse Burnout, and Job Dissatisfaction." *JAMA* 288 (2002): 1987-93.

Aiken, L. H., S. P. Clarke, and D. M. Sloane. "Hospital Staffing, Organization, and Quality of Care: Cross-National Findings." *Nursing Outlook* 50 (2002): 187-94.

Aiken, L. H., H. L. Smith, and E. T. Lake. "Lower Medicare Mortality Among a Set of Hospitals Known for Good Nursing Care." *Medical Care* 32 (1994): 771-87.

Cho, S. H., S. Ketefian, V. H. Barkauskas, et al. "The Effects of Nurse-Staffing on Adverse Events, Morbidity, Mortality, and Medical Costs." *Nursing Research* 52 (2003): 71-79.

JCAHO. *Health Care at the Crossroads: Strategies for Addressing the Evolving Nursing Crisis*. Oak Brook Terrace, IL: JCAHO, 2002.

JCAHO. *Implementation Guide for the NQF Endorsed Nursing-Sensitive Care Performance Measures*. Oak Brook Terrace, IL: JCAHO, 2005.

Kovner, C., P. J. Gergen. "Nurse Staffing Levels and Adverse Events Following Surgery in U.S. Hospitals." *Image: Journal of Nursing Scholarship* 30, no. 4 (1998):315-21.

National Quality Forum. *National Voluntary Consensus Standards for Nursing-Sensitive Care*. Washington, DC: NQF, 2004.

Needleman, J., P. I. Buerhaus, M. Stewart, K. Zelevinsky, and S. Mattke. "Nurse Staffing Levels and Quality of Care in Hospitals," *NEJM* 346, no. 22 (2002): 1415-22.

Reports from the Institute of Medicine *Crossing the Quality Chasm: A New Health System for the 21st Century* (2001).

To Err is Human: Building a Safer Health System (1999).

Keeping Patients Safe: Transforming the Work Environment of Nurses (2003).

Correction Notice

In Issue 2 of *Charting Nursing's Future*, a map on page 3 inadvertently misidentified two states in their relationships to the Nurse Licensure Compact. A corrected version of this map, which accurately identifies Wisconsin as a Compact state and Minnesota as a non-Compact state, can be accessed in an updated PDF of the brief at the following URL: <http://www.rwjf.org/files/publications/other/ChartingNursingFuture1105.pdf>



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