

Strengthening Hospital Nursing

Preventing the estimated shortage of more than 400,000 RNs by 2020 will require recruiting many talented men and women and making long-overdue improvements in the hospital workplace.

by **Peter I. Buerhaus, Jack Needleman, Soeren Mattke, and Maureen Stewart**

ABSTRACT: Hospitals, nurses, the media, Congress, and the private sector are increasingly concerned about shortages of registered nurses (RNs) and the impact on safety and quality of patient care. Findings from a growing number of studies provide evidence of a relationship between hospital nurse staffing and adverse outcomes experienced by medical and surgical patients. These findings have policy implications for strengthening the nursing profession, monitoring the quality of hospital care associated with nursing, and improving the relationship between hospitals and the nursing profession.

EVIDENCE RELATING NURSING SHORTAGES and reduced staffing in hospitals to lower quality of care is increasing and comes from a variety of sources.¹ In particular, in a recent federally funded study we found that inpatient hospital nurse staffing is related to patient outcomes in both medical and surgical patients and that these relationships are stronger for registered nurses (RNs) than for licensed practical nurses or nurse aides.²

Patient outcomes associated with nurse staffing involve varying levels of harm to patients, including the risk of death. The estimates of the decreased risk of adverse patient outcomes we found to be associated with higher nurse staffing are substantial in light of the number and costs of these complications (Exhibit 1). The implications of doing nothing to improve nurse staffing levels in many low-staffed U.S. hospitals are that a large number of patients will suffer avoidable adverse outcomes, and hospitals and patients will continue to incur higher costs than are necessary.

Addressing the implications of these findings will be difficult, however, because of the current shortage of hospital RNs. The shortage is the result of an imposing combination of factors: rising demand for RNs driven by increasing admis-

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EXHIBIT 1
Summary Of Findings On The Association Between Nurse Staffing And Outcomes
Potentially Sensitive To Nurse Staffing, Eleven-State All-Patient Sample, 1997

Patient outcome	Medical patients			Major surgery patients		
	Relationship	Estimated impact of shift to		Relationship	Estimated impact of shift to	
		High RN	High all staffing		High RN	High all staffing
Length-of-stay	Consistent	3-6%	3-12%	None		
Urinary tract infection	Consistent	4-12%	4-25%	Some evidence	5-6%	3-14%
Pneumonia	Consistent	6-8%	6-17%	Weak	11%	19%
Upper gastrointestinal bleeding	Consistent	5-7%	3-17%	None		
Shock/cardiac arrest	Consistent	6-10%	7-13%	None		
Failure to rescue ^a	Weak	3%	NA	Consistent	4-6%	2-12%

SOURCE: See below.

NOTES: We considered a relationship consistent if a statistically significant association was observed over a range of alternative ways of specifying the staffing variables in our regression analysis. The estimated impact is the percentage reduction in the rate of the outcome predicted by multiple regression models of moving from low staffing to high staffing for some or all nurse-staffing variables. The base case is low staffing (the value of the nurse staffing variables found at the first quartile, or middle of the bottom half, of the distribution of hospitals) for all staffing variables. The "high RN" column reports the percentage reduction in outcomes if registered nurse (RN) staffing is then changed to high (third quartile, middle of the upper half). The "high all staffing" column reports the percentage reduction in outcomes if values for all staffing variables are changed to high. A range of values is reported because ten alternative regression models were tested for each outcome. For example, in the case of urinary tract infections in medical patients, if nurse staffing is shifted from low (first quartile) for all staffing variables by setting RN staffing to high (third quartile), then the models estimate a reduction in urinary tract infections of 4-12 percent. Alternatively, if all nurse staffing is shifted from low to high in the regression models, the estimated rate of urinary tract infections in medical patients would decrease by 4-25 percent. See J. Needleman et al., *Nurse Staffing and Patient Outcomes in Hospitals*, Final Report (Washington: Department of Health and Human Services, Health Resources and Services Administration, 2001), for further description.

^aAs defined for this study, "failure to rescue" measures death among patients with five life-threatening complications—pneumonia, shock and cardiac arrest, upper gastrointestinal bleeding, sepsis, and deep vein thrombosis—for which early identification by nurses and intervention can influence the risk of dying.

sions and sicker patients requiring more intensive nursing care; lack of good RN substitutes; a less-than-satisfactory working climate for many RNs; inflation-adjusted earnings that have fallen in all but two years since 1993; declining enrollment in nursing education programs each year since 1995; and a strong economy in the late 1990s that allowed some married RNs to reduce time spent in the workforce.³ In addition, evidence suggests that RN shortages in hospital intensive care units and operating rooms are attributable in part to demographic changes in the RN workforce.⁴

Beyond the current RN shortage, the aging of the RN workforce and of the population as a whole makes addressing the problems affecting nursing both essential and more difficult. Women graduating from high school in the 1990s were 35 percent less likely to enroll in nursing education programs than were women graduating in the 1970s. As a result, the average age of working RNs has risen at more than twice the rate of all other occupations in the U.S. labor force. Today the average age of employed RNs is 43.3 years, and more than 60 percent are older than age forty. The average age is projected to rise another 3.5 years by 2010, when more

than 40 percent of the RN workforce will be older than age fifty. The inability of the nursing profession to replace the large number of RNs born in the baby-boom generation (the bulk of the workforce) who will soon begin retiring means that the size of the RN workforce will contract after 2010 and the largest group of RNs remaining in the workforce will be in the 50–60 age group. Coincidentally, over the same period many of the nation's eighty million baby boomers will turn sixty-five, and the demand for RNs is expected to greatly accelerate. The gap between the demand and the supply of RNs is projected to be well over 400,000 RNs by 2020, and enrollment into nursing education programs would have to increase immediately by 40 percent to offset this projected gap.⁵

Absent effective interventions, the magnitude of the projected RN shortage not only will decrease access to care but could cripple the health care system. If future hospital nurse staffing levels fall, then more patients will face a greatly increased risk of serious adverse complications. Thus, we believe that health policymakers have a full agenda in three areas: strengthening the RN workforce, monitoring the quality of hospital patient care associated with nursing, and improving the relationship between hospitals and the nursing profession.

Policy Prescriptions

■ **Strengthening the future RN workforce.** The variety of forces affecting the nursing profession calls for policy actions aimed at preventing further destabilization of the current workforce and strengthening the future RN workforce. Policy efforts should focus on raising the supply of RNs, redesigning the work content and organization of hospital-based nursing care, and improving the education of RNs.

Some efforts are already under way. In September 2001 Health and Human Services (HHS) secretary Tommy Thompson announced that eighty-two colleges, universities, and other organizations would receive \$27.4 million in grants and contracts designed to increase the number of RNs and the quality of nursing services. State legislatures in more than a dozen states either have passed legislation or have legislation pending to increase the supply of RNs. In February 2002 the private sector became involved, as the Johnson & Johnson Company launched a two-year, \$20 million campaign to increase enrollment in nursing. The campaign is running television advertisements that promote nursing, sending materials about nursing to more than 20,000 high schools, creating scholarships for students and faculty, raising funds, and maintaining a Web site containing comprehensive information about opportunities in nursing.

At the time this paper was written (April 2002), however, Congress had failed to enact legislation that would help to increase the supply of RNs. Throughout 2001 Congress held hearings, and three pieces of legislation to fund a variety of programs aimed at increasing enrollment in nursing education programs were introduced.⁶ In late spring 2001, however, momentum was lost when testimony

given in a congressional hearing asserted that there was no shortage of RNs; rather, the shortage was said to be a reflection of a poor workplace climate and hence could be eliminated solely by improving working conditions in hospitals. A follow-up U.S. General Accounting Office (GAO) study to determine whether or not nursing shortages exist concluded that the evidence for a long-term shortage was clear but that for a current shortage it was mixed.⁷ Unfortunately, the GAO report, released in July, resulted in Congress's deferring further action on nursing legislation until fall 2001. In the aftermath of 11 September 2001, the House and Senate were unable to pass their respective nursing bills until late in December. Since then action to reconcile the competing House and Senate bills has been held up not so much on substantive grounds as on procedural questions concerning how the joint conference committee can accommodate the individual members involved in developing the legislation. In our view, Congress must conclude its debate over the existence of an RN shortage and resolve its procedural issues without further delay. Congress needs to become a partner with the states and the private sector to help increase the supply of RNs and address issues affecting the nursing workforce.

There is a need for a clear goal against which to measure the adequacy of public- and private-sector responses to the projected long-term shortage of RNs. We propose that this goal be the prevention of the 400,000-RN shortage. Meeting this goal will require further efforts to recruit talented women and men into nursing; expanding nurse education programs; solving faculty shortages; and supporting nontraditional educational programs that enable licensed practical nurses (LPNs), nurse aides, and others who have demonstrated their commitment to patient care to obtain the training and skills needed to become RNs.

■ **Redesigning the work content and organization of hospital-based nursing care.** There is abundant evidence documenting the inordinate amount of time nurses spend in functions other than providing patient care. Excessive paperwork, inefficient communication systems, outdated patterns of care delivery, and other difficulties not only contribute to low job satisfaction and a frustrating work environment but are major barriers to providing efficient and appropriate nursing care. Hospital-based nursing care needs redesign.

Efforts in the mid-1990s aimed at restructuring hospital nursing were largely unsuccessful. Then, many hospitals focused on cost cutting; relied heavily on external consultants to effect change; did not plan for or implement a thoughtful evaluation of the results of work and organizational redesign (including effects on patient outcomes); and often failed to include physicians, labor unions, and nurses themselves in the process of redesigning the work and organization of nursing.⁸

Policymakers and foundations should stimulate the development of effective work-redesign strategies. Especially important to this effort is the support and active participation of leaders of state and national hospital associations, nursing professional organizations, and labor unions. We are encouraged by hospitals' ap-

preciation of the need for action in this area in an April 2002 report of the American Hospital Association Commission on Workforce for Hospitals and Health Systems.⁹

For hospitals to succeed in redesigning work, three things are needed. First, effective models must be identified. Second, we must understand what is required to ensure successful implementation of the models. Third, both the models and lessons of implementation need to be widely disseminated. Making and evaluating change in an organization requires resources, which are in short supply in today's hospitals. Dissemination also requires resources. Both the federal government and foundations have a role in assuring that these resources are available.

The Agency for Healthcare Research and Quality (AHRQ) should continue to fund hospitals, nursing schools, and other affected parties to experiment with changing the content of the work traditionally performed by nurses and modifying those aspects of the culture of nursing and hospitals that may be barriers to effective work redesign. AHRQ should be joined in these efforts by foundations and by other federal agencies, such as the Centers for Medicare and Medicaid Services (CMS) and the National Institute for Nursing Research. These organizations can organize conferences and meetings to engage leaders in identifying current best practices; defining criteria and processes for successful redesign; and formulating strategies to evaluate the alternative models from the perspectives of patients, nurses, and hospitals. Disseminating the results of work redesign through conferences, the Internet, and other means will increase the pace of change and contribute to the overall success of reorganizing hospital-based nursing. Analysis of the costs and implications of a redesigned hospital workplace is also required. Public and private payers may have to face the fact that improving patient safety and enhancing quality by strengthening hospital nursing will require an increase in payments to hospitals.

■ **Improving the education of RNs to better prepare for the future.** As the number of elderly Americans rises in the years ahead, hospitals will be taking care of a larger proportion of older, sicker patients. To cope with new clinical and management demands, hospitals are expected to expand their use of technology and information systems. Moreover, if the current emphasis on quality improvement continues, hospitals will focus increasingly on quality of care. Treating more older patients, using more technology, and being held accountable for higher levels of quality will present formidable challenges for the future hospital workforce. Meeting these challenges will be even more difficult for the nursing profession because the hospital RN workforce will be older itself and shrinking in total size.

Only 23 percent of baccalaureate nursing education programs have a required course in geriatric nursing.¹⁰ Fewer than 1 percent of RNs are certified as gerontological nurses, and fewer than 5 percent of advanced-practice nurses are certified geriatric nurse practitioners or geriatric nurse specialists. The need to address the nursing shortage and improve competency in geriatrics was, in fact, among the

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priorities identified by an October 2001 roundtable convened by Grantmakers In Health.¹¹ The John A. Hartford Foundation's Institute for Geriatric Nursing has been trying to address this educational need since 1996. The institute has published competencies in geriatric nursing for baccalaureate education, has compiled a best-practice curriculum guide, and annually recognizes (in partnership with the American Association of Colleges of Nursing) baccalaureate programs for exceptional curriculum in gerontologic nursing.¹² Policy- and grantmakers must encourage and facilitate further efforts by nursing education programs to implement and continue refining models of education in geriatric nursing.

The changes in nurses' work and role in health care delivery discussed above should influence how nurses are educated. Public and private policymakers must become more active in stimulating nursing education programs to develop and offer courses in clinical management so that RNs are better able to delegate nursing functions to others and oversee the larger non-RN nursing workforce that will inevitably be needed to provide adequate levels of patient care in the future. In addition, policymakers should develop programs that offer financial support for continuing education and formal course work designed to help RNs more capably use technology and computer information systems and apply quality improvement methods to clinical and administrative processes. The Accreditation Council for Graduate Medical Education (ACGME), the accrediting body for graduate medical education, now requires that residents be able to investigate and evaluate their patient care practices, appraise and assimilate scientific evidence, and improve their patient care practices. RNs in the future must also be able to understand variation in care delivery processes and demonstrate the ability to institute changes to improve as well as decrease variation in patient outcomes. We agree with Lucian Leape and others who believe that the time has come for nursing education to get in step with its medical colleagues and ensure that nurses are grounded in the theory and methods underpinning quality improvement.¹³

Monitoring The Quality Of Care Associated With Nursing

A second major area for policy making is monitoring the quality of care associated with nurse staffing in hospitals. The frequency, severity, and cost of errors in health care revealed by the Institute of Medicine (IOM) report *To Err Is Human* has resulted in increased public concern about patient safety and quality in hospitals.¹⁴ System-level problems that affect the organization of care are viewed as the principal cause of most errors, and the IOM report and others make clear the involvement of nursing in the occurrence of avoidable errors and mistakes and their adverse consequences for patients.¹⁵ In the years ahead, tracking the impact of

staffing will be important not only for monitoring clinical patient outcomes but also for assessing whether and to what extent errors are linked to system-level problems that affect hospital nurse staffing.

Monitoring patient outcomes will provide information with which to track how staffing levels and skill mix are changing and to determine whether patient outcomes are getting better or worse over time. Feeding this information back to hospital administrators, nursing administrators, managers, staff nurses, and physicians can guide efforts to modify nurse staffing, improve the quality of care, and make other needed changes in the hospital workplace climate.

We view the patient outcomes identified as related to nursing in our recent study and those of others not as measures of the full impact of nurse staffing on patient outcomes, but rather as quality indicators. Viewed from this perspective, they can provide a basis for constructing a system for monitoring the performance of nursing systems in hospitals.

■ **Improving data collection.** The ability to monitor patient outcomes that are related to nursing assumes that hospitals collect and report the information needed to construct measures of both outcomes and nurse staffing. However, in our work we found the quality of data available on nurse staffing very poor; to construct consistent and comparable measures across states and hospitals requires extraordinary effort. Thus, there is a pressing need to develop better data systems to support monitoring functions and future research on nurse staffing and patient care.

At a minimum, to assure that the data needed to monitor nurse staffing are available, current nurse staffing data collection by the American Hospital Association (AHA) and the CMS should be modified to include all categories of nursing staff (RNs, LPNs, and aides) and standard definitions of full- and part-time nursing personnel. The capacity to conduct future research and adequately monitor the relationship between nurses and hospitals would be greatly enhanced if these systems also reported nurse staffing by inpatient and outpatient setting and, ideally, by specific nursing unit type, including data on standard and overtime hours, as well as hours provided by part-time and contract or agency staff. There is also a need to have data available on the type of nursing practice (primary, team, functional, and so forth) The lack of publicly available and national data of this kind weakens the capacity to routinely assess and monitor the effects nursing organization has on patient outcomes. Like other researchers who have noted the poor quality of nurse-staffing data, we cannot underscore strongly enough how important it will be to have better data on nurse staffing to meet the increased demand to monitor nursing in hospitals.¹⁶

With respect to constructing patient outcomes based on hospital discharge abstracts and using them to monitor hospital-acquired complications, efforts have been hampered by the need to infer that a patient complication actually occurred in the hospital and not prior to hospitalization, and by underreporting of key complications on the discharge abstract. We urge two changes to improve data collec-

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tion and rectify these problems. The first is to expand and improve the coding of “present on admission” status for secondary diagnoses that are identified on the patient abstract. This would provide assurance that the patient outcome did, in fact, occur in the course of hospitalization. The second change is to require that specific secondary diagnoses that are hospital-acquired and are indicators of the performance of systems of care within hospitals always be reported on the discharge abstract. This list might be expanded beyond that needed to monitor the impact of nurse staffing, and these outcomes can be linked to other efforts to reduce medical errors and increase patient safety in hospitals. To make this improvement in data collection a reality will require the active involvement of the CMS, AHRQ, the National Advisory Committee on Vital and Health Statistics, the National Institute of Nursing Research, and other state and federal data agencies, as well as the AHA, the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), and other organizations involved in quality improvement.

Improving The Relationship Between Hospitals And Nursing

The last area that policymakers should address concerns the need to improve the overall relationship between hospitals and the nursing profession. Hospitals need an adequate supply of well-prepared, competent RNs to provide patient care, contribute to improving the quality of care, and meet the needs of a growing population of older people, and the nursing profession needs hospitals to provide the resources and environment for its clinicians to practice the art and science of nursing and to obtain income for its members. The organization and culture of “magnet” hospitals have been shown to attract and retain nurses and improve patient outcomes.¹⁷ This underscores the importance of effective hospital and nursing interaction in assuring patient safety.

But today, too many RNs are dissatisfied with the hospital workplace climate, feel overworked, and are burdened by duties that distract them from performing the activity that gives them the most satisfaction: providing patient care. Many hospital administrators are frustrated by what they view as lack of loyalty and commitment from nurses. Moreover, the likely inability to replace all of the RNs expected to soon leave the workforce presents a profound challenge to both the nursing profession and hospitals. Given this, we believe that there is no better time to find ways for these groups to work together more effectively. The question is, How can this occur?

The findings from our work and that of others on the relationship between nurse staffing and patient outcomes provide information that empowers both nurses and hospitals and offer a framework for a common agenda structured

around protecting patients and improving the quality of care. Now that the relationships between certain patient outcomes and nursing are known with greater certainty, one can argue that hospitals and nurses have a social responsibility to act on this knowledge by reducing the risk that patients will suffer an adverse patient outcome during their hospital stay. In our view, nurses and hospitals share this responsibility equally.

For nurses, these studies establish the empirical evidence that nursing matters greatly in hospitals' ability to provide high-quality care and prevent avoidable adverse outcomes. This information gives RNs credibility and increases their negotiating power to achieve long-sought-after improvements in their interactions with hospitals, physicians, and policymakers. For hospitals, the results of these studies provide objective information that can be used to influence public and private payers to make more financial resources available to help them support nurses and thereby ensure that the quality of patient care does not deteriorate.

Studies on quality of care related to nursing also provide information needed by policymakers to legitimize their taking action to promote opportunities for hospitals and nurses to work together more effectively. One highly visible opportunity is to provide the financial support needed to quickly improve the workplace, hire additional staff, raise salaries, and take other actions to make it easier for nurses and hospitals to strengthen their relationship.

SOLVING THE MULTIPLE PROBLEMS that entangle hospitals and the nursing workforce will not be easy or swift. We believe that making a serious commitment to improving quality and reducing the culture of blame provides a natural basis for nurses and hospital management to work together. Hospitals that have made such a commitment, maintained a strong relationship with their nursing staff despite the turbulent health care environment, involved nurses in work redesign, and created effective relationships with labor unions are well positioned to overcome the challenges that we have described in this paper. The 1997 partnership that Kaiser Permanente entered with its AFL-CIO-affiliated unions offers lessons for establishing and sustaining such cooperation.¹⁸ Given the vital role that both hospital managers and nurses play in providing health care, it is imperative that public and private policymakers become more sharply focused on helping nurses and hospitals and devote the resources and commitment needed to help them overcome these challenges. Although we have placed this issue third on our action list, building stronger relationships between hospitals and nurses is critical to improving quality and assuring the safety of the patients in their care.

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NOTES

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