Fact Sheet

Evidence-Based Research Showing Impact of RN Staffing on Patient Outcomes

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**Implications of the California Nurse Staffing Mandate for Other States**


- The researchers surveyed 22,336 RNs in California and two comparable states, Pennsylvania and New Jersey, with striking results, including: if they matched California ratios in medical and surgical units, New Jersey hospitals would have 13.9 percent fewer patient deaths and Pennsylvania 10.6 percent fewer deaths. “Because all hospitalized patients are likely to benefit from improved nurse staffing, not just general surgery patients, the potential number of lives that could be saved by improving nurse staffing in hospitals nationally is likely to be many thousands a year,” according to Linda Aiken, the study’s lead author. California RNs report having significantly more time to spend with patients, and their hospitals are far more likely to have enough RNs on staff to provide quality patient care. Fewer California RNs say their workload caused them to miss changes in patient conditions than New Jersey or Pennsylvania RNs. In California, where hospitals have better compliance with the staffing limits, RNs cite fewer complaints from patients and families and the nurses have more confidence that patients can manage their own care after discharge. California RNs are substantially more likely to stay in their jobs because of the staffing limits, and less likely to report burnout than nurses in New Jersey or Pennsylvania. Two years after implementation of the California staffing law—which mandates minimum staffing levels by hospital unit—“nurse workloads in California were significantly lower” than Pennsylvania and New Jersey. “Most California nurses, bedside nurses as well as managers, believe the ratio legislation achieved its goals of reducing nurse workloads, improving recruitment and retention of nurses, and having a favorable impact on quality of care,” the authors write.

**Impact of Medical Errors on 90-Day Costs and Outcomes: An Examination of Surgical Patients**


- A new study published in the journal Health Services Research found that the large difference in calculations for medical error expenses might mean that interventions to increase patient safety -- like adding more nursing staff -- could be more cost-effective than previously reported. The study found that insurers paid an additional $28,218 (52 percent more) and an additional $19,480 (48 percent more) for surgery patients who experienced acute respiratory failure or post-operative infections, respectively, compared with patients who did not experience either error. Preventing these and other preventable medical errors would reduce loss of life and could reduce healthcare costs by as much as 30 percent, the researchers said. "Many hospitals are struggling to survive financially," study co-author William Encinosa, senior economist at the Agency for Healthcare Research and Quality, said in a statement. "The point of our paper is that the cost savings from reducing medical errors are much larger than previously thought." Pointing to previous research that looked at the business case for improving RN staffing ratios, the researchers concluded: "It is quite possible that the post-discharge costs savings achieved by reducing adverse events might just be enough for the hospital to break-even on the investment in nursing."
Overcrowding and Understaffing in Modern Health-care Systems: Key Determinants in Meticillin-resistant Staphylococcus Aureus Transmission

- A new study published in the July issue of the journal Lancet Infectious Disease finds that understaffing of nurses is a key factor in the spread of methicillin-resistant Staphylococcus aureus (MRSA), the most dangerous type of hospital acquired infection. “Overcrowding and understaffing have had a negative effect on patient safety and quality of care, evidenced by the flourishing of health-care-acquired MRSA infections in many countries, despite efforts to control and prevent these infections from occurring. There is an urgent need for a requirement for developing resource allocation strategies that minimize MRSA transmission without compromising the quality and level of patient care,” the researchers concluded. The authors note that common attempts to prevent or contain MRSA and other types of infections such as requirements for regular and repeated hand washing by nurses are compromised when nursing staff are overburdened with too many patients. They also note that hospitals now involve nurses in a “vicious cycle” where a call for nurses to increase their infection control procedures “are seldom accompanied by increases in staffing levels and thus represent an additional work burden on nursing staff” that leads to a greater spread of infections.

Nurse Satisfaction and the Implementation of Minimum Nurse Staffing Regulations
Joanne Spetz, Ph.D, Policy, Politics & Nursing Practice, April 3, 2008

- A statewide survey of nurses in California found that nurses perceived a significant improvement in their working conditions and were more satisfied with their jobs in the two years following implementation of the landmark California staffing law in 2004. According to the researchers, “Nurse satisfaction with many aspects of work increased significantly between 2004 and 2006. The largest changes in satisfaction, in percentage terms, were with adequacy of staff (a 12.95 % increase), providing patient education (+7.3%), clerical support (6.9%) and satisfaction with the job overall (5.9%).” The authors concluded: “A large body of research links job satisfaction, heavy workload, job stress, effective management and career development opportunities with turnover rates…It is possible that the improvements in RN satisfaction documented here will facilitate higher quality of care. High nurse turnover has a negative effect on the quality of care delivered to patients. If minimum staffing regulations improve nurse satisfaction, reduce job stress, and relieve workload, nurse turnover may indeed decline, further improving the quality of hospital care.”

Survival From In-Hospital Cardiac Arrest During Nights and Weekends
Mary Ann Peberdy, MD, et al., JAMA, February 20, 2008

- A national study on the rate of death from cardiac arrest in hospitals found that the risk of death from cardiac arrest in the hospital is nearly 20 percent higher on the night shift. The authors highlight understaffing during the night shift as a potential explanation for the death rate. “Most hospitals decrease their inpatient unit nurse-patient ratios at night. Lower nurse-patient ratios have been associated with an increased risk of shock and cardiac arrest,” the authors stated.

Nurse Staffing and Patient, Nurse and Financial Outcomes
Lynn Unruh, PhD, RN, AJN, January 2008

- This report provides a comprehensive literature review of more than 21 studies published since 2002 that, according to the author, “underscore the importance of hospitals acknowledging the effect nurse staffing has on patient safety, staff satisfaction, and institutions’ financial performance.” According to the report, “the evidence clearly shows that adequate staffing and balanced workloads are central to achieving good patient, nurse, and financial outcomes. Efforts to improve care, recruit and retain nurses, and enhance financial performance must address nurse staffing and workload. Indeed, nurses’ workloads should be a prime consideration. If a proposed change would improve care and also reduce excessive (or maintain acceptable) workloads, it should be implemented. If not, it shouldn’t be.”
The Impact of Nurse Staffing on Hospital Costs and Patient Length of Stay: A Systematic Review
Petsunee Thungjaroenkul, RN, MS, Nursing Economics, Vol. 25, 2007

- This study provides a comprehensive review of the research on the impact of RN staffing ratios on hospital costs and patient length of stay (LOS). It identified 17 studies published between 1990 and 2006 and concluded: "the evidence reflected that significant reductions in cost and LOS may be possible with higher ratios of nursing personnel in hospital settings. Sufficient numbers of RNs may prevent patient adverse events that cause patients to stay longer than necessary. Patient costs were also reduced with greater RN staffing as RNs have higher knowledge and skill levels to provide more effective nursing care as well as reduce patient resource consumption. Hospital administrators are encouraged to use higher ratios of RNs to non-licensed personnel to achieve their objectives of quality patient outcomes and cost containment."

Newly Licensed RNs' Characteristics, Work Attitudes, and Intentions to Work
Christine T. Kovner, PhD, RN, et al, AJN, September, 2007

- A national study on the work experience and attitudes of newly licensed nurses found that the majority of new grads had been given full patient assignments immediately following their orientation, with poor supervision and management, while more than 45 percent reported having recently been given more than 6 patients to care for at one time -- a patient load that the researchers said placed their patients at an increased risk of injury or death. More than 55 percent reported that they had to work too fast; 33 percent reported having little time to get things done and nearly a third of new grads reported they had too many patients to get their job done well, Not surprisingly, as a result of these conditions, more than 37% of the new nurses say they plan to leave their current job in the next two years, and more than 41% say they, if free to do so, would take another job immediately. The authors conclude: "The proportion of newly licensed RNs who expressed negative attitudes on individual survey items raises the concern that employers will not be able to retain them in the acute care settings where they start out."

Staffing Level: a Determinant of Late-Onset Ventilator-Associated Pneumonia
Stephanie Hugonnet, et al, Critical Care, July 19, 2007

- Understaffing of registered nurses in hospital intensive care units increases the risk of serious infections for patients; specifically pneumonia, a preventable and potential deadly complication that can add thousands of dollars to the cost of care for hospital patients. This type of pneumonia is a leading cause of as many as 2,000 patient deaths in Mass. hospitals, costing as much as $400 million annually.

Nurse Working Conditions and Patient Safety Outcomes
Patricia W. Stone, Ph.D., et al., Medical Care, 45(6): 571-578, June. 2007

- A review of outcomes data for more than 15,000 patients in 51 U.S. hospital ICUs showed that those with higher nurse staffing levels had a lower incidence of infections, such as central line associated bloodstream infections (CLSBIs), a common cause of mortality in intensive care settings. The study found that patients cared for in hospitals with higher staffing levels were 68 percent less likely to acquire an infection. Other measures such as ventilator-associated pneumonia and skin ulcers were also reduced in units with high staffing levels. Patients were also less likely to die within 30 days in these higher-staffed units. Increasing RN staffing could reduce costs and improve patient care by reducing unnecessary deaths and reducing days in the hospital.

Hospital Workload and Adverse Events
Joel S. Weisman, Ph.D., et al, Medical Care, 45(5): 448-454, May. 2007

- A study conducted by researchers at Brigham & Women’s Hospital and Massachusetts General Hospital found that overcrowded and understaffed hospitals that are pushing too hard to streamline and cut costs are putting their patients at risk for medication errors, nerve injuries, infections and other preventable mistakes. A 10% increase in the number of patients assigned to a nurse leads to a 28% increase in adverse events such as infections, medication errors, and other injuries.
A comprehensive analysis of all the scientific evidence linking RN staffing to patient care outcomes found consistent evidence that an increase in RN-to-patient ratios was associated with a reduction in hospital-related mortality, failure to rescue, and other nurse sensitive outcomes, as well as reduced length of stay. Every additional patient assigned to an RN is associated with a 7% increase in the risk of hospital-acquired pneumonia, a 53% increase in respiratory failure, and a 17% increase in medical complications.

Quality of Care for the Treatment of Acute Medical Conditions in U.S. Hospitals

- A national study of the quality of care for patients hospitalized for heart attacks, congestive heart failure and pneumonia found that patients are more likely to receive high quality care in hospitals with higher registered nurse staffing ratios.

Impact of Hospital Nursing Care on 30-day Mortality for Acute Medical Patients

- A study of 46,000 patients in 76 hospitals found the adequacy of nursing staffing and proportion of registered nurses is inversely related to the death rate of acute medical patients within 30 days of hospital admission. The study’s authors recommend that “if hospitals have goals of minimizing unnecessary patient death for their acute medical patient population, they should maximize the proportion of Registered Nurses in providing direct care.”

HealthGrades Quality Study: Third Annual Patient Safety in American Hospital Study
HealthGrades, Inc: April 2006

- 80,000 Medicare patients each year died between 2002 – 2004 in our nation’s hospitals from preventable medical errors, with 63% of those deaths attributable to failure to rescue by a registered nurse or physician. Mass. Ranked 22nd in patient safety, with no improvement since the previous year’s study.

Nurse Staffing in Hospitals: Is There a Business Case For Quality?

- Increasing the proportion of RNs without increasing total nursing hours per day could reduce costs and improve patient care by reducing unnecessary deaths and reducing days in the hospital.

Longitudinal Analysis of Nurse Staffing and Patient Outcomes – More About Failure to Rescue

- Increasing RN staffing increased patient satisfaction with pain management and physical care; while “having more non-RN” care “is related to decreased ability to rescue patients from medication errors.”

Correlation Between Annual Volume of Cystectomy, Professional Staffing, and Outcomes – A Statewide, Population-Based Study

- Patients undergoing common types of cancer surgery are safer in hospitals with higher RN-to-patient ratios. High RN-to-patient ratios were found to reduce the mortality rate by greater than 50% & smaller community hospitals that implement high RN ratios can provide a level of safety and quality of care for cancer patients on a par with much larger urban medical centers that specialize in performing similar types of surgery.
Improving Nurse-to-Patient Staffing Ratios as a Cost-Effective Safety Intervention

- Improving RN-to-patient ratios could save thousands of lives each year and is more cost effective than clot-busting medications for heart attacks and strokes, and cancer screenings.

Hospital Speedups and the Fiction of the Nursing Shortage

- “There is no shortage of nurses in the United States. The number of licensed registered nurses in the country who are choosing not to work in the hospital industry due to stagnant wages and deteriorating working conditions is larger than the entire size of the imagined ‘shortage.’ Thus, there is no shortage of qualified personnel—there is simply a shortage of nurses willing to work under the current conditions created by hospital managers.”

Nurses’ Working Conditions: Implications for Infectious Disease

- Improving nurse staffing and working conditions “are likely to improve the quality of health care by decreasing incidence of many infectious diseases, and assisting in retaining qualified nurses.”

The Working Hours of Hospital Staff Nurses and Patient Safety

- Nurses working mandatory overtime are three times more likely to make a medical error. “Overtime, especially that associated with 12-hour shifts, should be eliminated.”

Association Between Evening Admissions and Higher Mortality Rates in the Pediatric Intensive Care Unit

- Children admitted to pediatric intensive care units at night are more likely to die in the first 48 hours of care; authors point to fatigue and lighter nurse staffing levels as contributing factors.

Consumer Perspectives: The Effect of Current Nurse Staffing Levels on Patient Care
National Consumers League Report, May 2004

- National survey of recent patients in hospitals found that 45% believed their safety was compromised by understaffing of nurses; 12% believe their safety was extremely compromised. 78% of respondents support safe staffing legislation.

Nurse Staffing Levels and Quality of Care in Hospitals
Mark W. Stanton, M.A., *AHRQ Research in Action*, 14; March 2004

- Poor hospital registered nurse staffing is associated with higher rates of urinary tract infections, post-operative infections, pneumonia, pressure ulcers and increased lengths of stay, while better nurse staffing is linked to improved patient outcomes.

Nurse Burnout and Patient Satisfaction

- Improvements in nurse staffing in hospitals “simultaneously reduces nurses’ high burnout and risk of turnover and increases patients’ satisfaction with their care.”
Is More Better? The Relationship Between Nurse Staffing and the Quality of Nursing Care in Hospitals
Julie Sochalski, Medical Care, 42(2): II-67-II-73, Feb 2004

- Survey of 8,000 RNs in Pennsylvania hospitals found workload and understaffing contributed to medical errors and patient falls and to a number of important nursing tasks left undone at the end of every shift.

Nurse Staffing and Mortality for Medicare Patients with Acute Myocardial Infarction
Sharina D. Peterson, Ph.D., et al., Medical Care, 42(1): 4-12, Jan. 2004

- “Medicare patients with AMI (heart attack) who were treated in higher RN staffing environments had a significant in-hospital mortality advantage.” Conversely, patients are more likely to die in hospitals with high LPN staffing environments. “The mortality difference we observed is related to differences in hospital staffing patterns and may derive from substitution of personnel with less training or experience…”

The Shocking Cost of Turnover in Health Care

- The cost for advertising, training and loss in productivity associated with recruiting new nurses to a facility is $37,000 per nurse at minimum and can add as much as 5% to a hospital’s annual budget. Improving nurses’ staffing conditions is a primary strategy for hospitals that can generate significant cost savings.

Keeping Patients Safe: Transforming the Work Environment of Nurses
Institute of Medicine, National Academy of Sciences, Nov. 2003

- Following up on the 1999 report on patient safety, To Err is Human, the Institute for Medicine calls for improved nurse-to-patient ratios, limits on mandatory overtime, and nurse involvement on every level to protect patients.

Licensed Nurse Staffing and Adverse Events in Hospitals
Lynn Unruh, Ph.D., Medical Care, 41(1): 142-152, 2003

- Hospitals with better licensed nurse staffing had a significantly lower incidence of adverse patient events, including bed sores, patient falls and pneumonia.

Nurse Staffing, Quality, and Hospital Financial Performance

- Increased staffing of registered nurses does not significantly decrease a hospital’s profit margin, even though it boosts the hospital’s operating costs.

The Effects of Nurse Staffing on Adverse Events, Morbidity, Mortality, and Medical Costs

- Increasing nurse staffing by just one hour per patient day resulted in a 10% reduction in the incidence of hospital-acquired pneumonia. The cost of treating hospital acquired pneumonia is $28,000 per patient.

Patient-to-Nurse Staffing Ratios: Perspectives from Hospital Nurses
Peter D. Hart Research Corp., A Research Study for AFT Health Care, April 2003

- Three in five nurses say they are responsible for too many patients and the problem is harming care. 82% of nurses support legislation setting limits on nurses’ patient assignments.
Hospital Nurse Staffing and Patient Mortality, Nurse Burnout, and Job Dissatisfaction

- For each additional patient over four assigned to an RN, the risk of death increases by 7% for all patients. Patients in hospitals with a 1:8 nurse-to-patient ratio have a 31% greater risk of dying than patients in hospitals with 1:4 nurse-to-patient ratios. Legislation to regulate RN-to-patient ratios is a credible means of protecting patients and to ending the nursing shortage.

Strengthening Hospital Nursing

- “The implications of doing nothing to improve nurse staffing levels in many low-staffed 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.”

Nurse Staffing and Healthcare-associated Infections

- “There is compelling evidence of a relationship between nurse staffing and adverse patient outcomes,” including serious bloodstream infections in hospital patients.

Nurse-Staffing Levels and Quality of Care in Hospitals

- A higher proportion of RNs in the staff mix and a greater number of nursing hours per day are associated with better patient outcomes.

Health Policy Report – Nursing in the Crossfire

- Provides a review of the research underlying the current crisis in nursing with recommendations for policy, including legislation to regulate RN ratios and to recruit nurses into the profession.

Health Care at the Crossroads: Strategies for Addressing the Evolving Nursing Crisis
Joint Commission on Accreditation of Healthcare Organizations (JCAHO), 2002

- JCAHO found that low staffing levels were a contributing factor in 24% of patient safety errors resulting in injuries or death since 1996. Recommends transforming the nursing workplace and giving hospitals an incentive to invest in high quality nursing care.

Intensive Care Unit Nurse Staffing and the Risk of Complications After Abdominal Aortic Surgery

- Patients treated in hospitals with fewer ICU nurses were more likely to have medical complications, respiratory failure or need a breathing tube inserted. The study also found the ICUs with fewer RNs incurred a 14% increase in costs.
Nurses’ Reports on Hospital Care in Five Countries

- Study finds widespread job dissatisfaction among hospital nurses in the US due to understaffing and poor working conditions. Half of US nurses report the quality of care at their hospital has deteriorated in the last year; one in five nurses overall and one in three nurses under 30 plan on leaving bedside nursing.

The Nursing Crisis in Massachusetts
Report of the Legislative Special Commission on Nursing and Nursing Practice, May 2001

- “It is the unanimous consensus of licensed nurses, health care personnel and administrators that the shortage of nursing care in the Commonwealth is endangering the quality of care that our nurses can provide to the patient.” The Commission’s top two recommendations to solve the crisis include legislation to ban mandatory overtime and to set RN-to-patient ratios.

ICU Nurse-to-Patient Ratio is Associated with Complications and Resource Use After Esophagectomy

- A nurse caring for more than two ICU patients at night increases the risk of several post-operative pulmonary and infectious complications and was associated with increased resource use. The study advocates a ratio of one RN to no more than two patients.

Organization and Outcomes of Inpatient AIDS Care

- Higher nurse-to-patient ratios are strongly associated with a lower mortality for patients with AIDS in hospitals.

Nurse Staffing and Patient Outcomes

- Inpatient units with a higher proportion of RN care had fewer adverse patient outcomes, including fewer medication errors, bedsores and patient complaints. Conversely, when more care was delivered by non-RN team members, rates of bedsores, complaints and patient deaths increased.

Downsizing the Hospital Nurse Workforce

- Hospitals cut nurse staffing levels in the 90s by 7.3% nationally, while all other categories of hospital personnel increased, including a 46% increase in non-nurse administrative personnel and 50% increase in other direct care staff. Massachusetts cut its RN staffing by 27%, highest in the nation.