STAFFING AND HEALTH REFORM: The Impact of Nurse Staffing on Medicare Reimbursement

“Hospital administrators wishing to maximize Medicare reimbursement will realize the greatest impact by improving patient satisfaction with nursing care.”


Under the Patient Protection and Affordable Care Act, factors that will effect hospital reimbursement include:

- 30-day readmission rates for acute myocardial infarction, heart failure and pneumonia;
- Hospital Acquired Infection rates;
- 30-day mortality rates for acute myocardial infarction, heart failure and pneumonia;
- Patient satisfaction as measured by HCAHPS Patient Satisfaction Surveys.

Following are summaries of several research studies showing the link between these factors and nurse staffing as well as the impact of nurse staffing on the hospital's bottom line.

Readmissions:

- Researchers at Marquette University analyzed how nurse staffing levels played a role in preventable hospital readmissions, discharge readiness and post-discharge emergency visits. Higher non-overtime RN staffing levels decreased the risk of readmissions while higher overtime staffing levels increased the risk of patients revisiting the emergency department recently after discharge. Weiss ME, Yakusheva O, Bobay, KL. Quality and cost analysis of nurse staffing, discharge preparation and post discharge utilization. Health Services Research online, 2011.

- Patients discharged from hospitals in the lowest quartile of nurse staffing (28.5%) had higher readmission rates than those from hospitals in the highest quartile. Joyne, Karen E. and Ashish K. Jha. Who Has Higher Readmission Rates for Heart Failure, and Why?Implications for Efforts to Improve Care Using Financial IncentivesCirculation: Cardiovascular Quality and Outcomes. 2011. 4:53-59.

Hospital Acquired Infections/Medication Errors

- A study of medication errors in two hospitals over a 6-month period found that nurses were responsible for intercepting 86 percent of all medication errors made by physicians, pharmacists and others involved in providing medications for patients before the error reached the patient. Leape, L. et. al, "Systems analysis of adverse drug events." Journal of the American Medical Association 274 (1): 35-43

- In a study of data from eleven states, higher nurse staffing levels were related to lower instances of urinary tract infections, pneumonia, upper gastrointestinal bleeding and shock in medical patients and lower rates of “failure to rescue” in major surgery patients. Needleman, J.; Buerhaus, P.; Mattke, S; Stewart, S.; and Zelevinsky, K. Nurse Staffing and Patient Outcomes in Hospitals. U.S. Department of Health and Human Services: February 2001.

A 2006 study by Heather K. Spence Laschinger, Ph.D, R.N., and Michael P. Leiter, Ph.D., found that patient safety outcomes are related to the quality of the nursing practice work environment. Strong correlations exist between low staffing levels and increased emotional exhaustion, which leads to more patient complaints, nosocomial infections (infections received from hospital care such as urinary tract or staph infections) and medication errors. Laschinger, Heather K. Spence and Michael P. Leiter. “The Impact of Nursing Work Environments on Patient Safety Outcomes”. The Journal of Nursing Administration, Volume 36, No. 5, May 2006

RN staffing levels are negatively correlated to rates of blood infections, ventilator-associated pneumonia, 30-day mortality, and pressure ulcers. Those conditions, as well as urinary tract infections, are also negatively correlated with RN contact hours. There was no correlation to magnet status. Stone, Patricia W., et. al., Nurse Working Conditions and Patient Safety Outcomes, Medical Care, Volume 45, Number 6, June 2007

A 2003 study in Nursing Research found a correlation between nurse staffing levels and adverse events. Patients experienced an 8.9% decrease in contracting pneumonia when given one hour more RN care per day. Also, increasing the nurse-to-patient ratio by 10% is associated with a 9.5% decrease in the likelihood of contracting pneumonia. Cho, S., S. Ketefian, V.H. Barkauskas, and D.G. Smith, (2003). The Effects of Nurse Staffing on Adverse Events, Morbidity, Mortality, and Medical Costs. Nursing Research, 52(2), 71-79.

More RN direct care time per resident day was associated with fewer complications including; pressure ulcers, hospitalizations, and UTIs. There were fewer incidences of weight loss, catheterization, deterioration of daily abilities, and greater use of oral nutritional supplements. Horn, S., et. al., RN Staffing Time and outcomes of Long-Stay Nursing Home Residences, American Journal of Nursing, 105, 2005

A study of 2,470 patients at the University of Geneva Hospitals found that 23% of the 936 patients who underwent mechanical ventilation developed ventilator-associated pneumonia (VAP). The researchers found that a high nurse-to-patient ratio was strongly associated with a decreased risk for late-onset VAP. Hugonnet, S., et. al., Staffing level: a determinant of late-onset ventilator-associated pneumonia, Critical Care, Volume 11, Number R80, 2007.


A 2005 study showed that low nurse staffing increased the incidence of methicillin resistant staphylococcus aureus (MRSA), the so-called ‘superbug.’ BBC News, “MRSA linked to nurse shortages”, May 6, 2005. http://news.bbc.co.uk/1/hi/health/4522141.stm

In a study of long-term care facilities, patients in facilities with more direct RN time (30 to 40 minutes per patient, per day) had fewer pressure ulcers, acute care hospitalizations, urinary tract infections, urinary catheters, and less deterioration in their ability to perform the tasks of daily living. Clarke, Sean P., N.E. Donaldson. Adequate nurse staffing. In Hughes, R.D. (Ed.) Patient Safety & Quality: An Evidence Based Handbook for Nurses. Agency for Healthcare research and Quality, Publication No. 08-0043, Rockville, MD, March 2008.

Low staffing levels are associated with higher rates of adverse outcomes. Adverse outcomes sensitive to nurse staffing, like urinary tract infections, pneumonia, pressure ulcers and falls, can all lead to longer hospital stays and increased costs for hospitals. Stanton, Mark. “Hospital Nurse Staffing and Quality of Care”, Department of Health and Human Resources, Agency for Healthcare research and Quality, Issue #14, March 2004.
Mortality Rates:

- After adjusting for patient and hospital characteristics, each additional patient per nurse was associated with a 7% increase in the likelihood of patients dying within 30 days of admission and a 7% increase in failure to rescue. Aiken, Linda et. al., "Hospital Nurse Staffing and Patient Mortality, Nurse Burnout and Job Dissatisfaction," Journal of the American Medical Association, Vol. 288, No. 16, October 23/30, 2002, pps. 1987-1993.

- Mortality-risk rates decrease by 9 percent for ICU patients and 16 percent for surgery patients with the increase of one FTE RN per patient day. One additional nurse hour per day with a patient was associated with a 1.98 percent decrease in death rate. Kane, Robert L, et.al. "Nurse Staffing and Quality of Patient Care," AHRQ Publication No. 07-E005, Evidence Report/Technology Assessment Number 151, March, 2007

- A 2006 study in the UK indicated that hospitals with the most favorable nurse staffing ratios had consistently better outcomes than those with lower nurse staffing ratios. The study found that patients in hospitals with the lowest nurse-to-patient staffing ratios had 26% higher mortality rates and patients were 29% more likely to die following complicated hospital stays than those patients in hospitals with higher nurse-to-patient ratios. Rafferty, Ann Marie, Sean Clarke, Linda H. Aiken and others (IN PRESS). Effects of Nurse Staffing on Patient Mortality and Nurse retention in English Hospitals

- Study found a ten percent increase in the proportion of RNs as a percentage of total hospital staff was associated with five fewer patient deaths for every 1000 discharged patients Tourangeau, Ann E., et. al., Nursing-Related Determinants of 30-day Mortality for Hospitalized Patients, Canadian Journal of Nursing Research, 2002, vol. 33., No. 4, 71-88.

- Nurse staffing shortages are a factor in one out of every four unexpected hospital deaths or injuries caused by errors Joint Commission for the Accreditation of Healthcare Organizations, 2002.

- In a study of 2190 hospitals it was found that 10.7% of the variance in patient mortality was explained by nurse staffing ratios. . "A Matter of Life and Death," Modern Healthcare, Special Supplement, September 30, 2002, pps. 16-20.


Patient Satisfaction

- Patients cared for on units that nurses characterized as having adequate staff, good administrative support for nursing care, and good relations between doctors and nurses were more than twice as likely as other patients to report high satisfaction with their care and their nurses reported significantly lower burnout. The overall level of nurse burnout on hospital units also affected patient satisfaction. Doris C. Vahey, Linda H. Aiken, Douglas M. Sloane, Sean P. Clarke, Delfino Vargas. Nurse Burnout and Patient Satisfaction. Med Care, 2004 February: 42 (Suppl) 1157-1166.

- Patient Satisfaction scores were significantly higher in hospitals that had a “better” work environment for nurses and significantly higher in hospitals with better nurse to patient ratios. There was a ten point difference in the percentage of patients who would definitely recommend the hospital -- depending on
whether patients were in a hospital with a good work environment for nurses or one with a poor work environment.  Ann Kutney-Lee, et al.  *Nursing: A Key to Patient Satisfaction.*  Health Affairs.  July/August 2009, vol. 28, no. 4, 669-677.

- The nurse working environment has a significant impact on patient satisfaction. Patients reported lower satisfaction levels in hospitals that had higher percentages of “burnt out” or dissatisfied nurses.  Linda Aiken et al.  *Patient safety, satisfaction, and quality of hospital care: cross sectional surveys of nurses and patients in 12 countries in Europe and the United States.*  BMJ 2012;344:e1717

- A five point increase in the rating of nursing care will yield a 27% increase in overall rating of the hospital. Contrast with physicians where a 5-point increase in the score yields only a 5.6% increase in overall rating of the hospital. “Hospital administrators wishing to maximize Medicare reimbursement will realize the greatest impact by improving patient satisfaction with nursing care.” Robert Wolosin, Louis Ayala, Bradley R. Fulton.  *Nursing Care, Inpatient Satisfaction and Value-Based Purchasing.*  Journal of Nursing Administration, Vol. 42, No.6, June 2012.

- The higher the percentage of hours of nursing care, the lower level of pain perceived by patients and the greater the patients’ satisfaction post-discharge.  Patricia Potter et al.  *Identifying Nurse Staffing and Patient Outcome Relationship: A Guide for Changes in Care Delivery.*  Nursing Economics.  July-August 2003, Vol 21 No 4, 158-166

**Improving patient outcomes by staffing correctly leads to lower costs.**

- Increasing the nurse-to-patient ratio by 10% is associated with a 9.5% decrease in the likelihood of contracting pneumonia. Pneumonia was associated with an increase of 5.1 to 5.4 days in a patient’s length of stay, an increase of 4.7-5.6% in the probability of death, and an additional $22,390-$28,505 in costs.  Cho, S., S. Ketefian, V.H. Barkauskas, and D.G. Smith, (2003).  *The Effects of Nurse Staffing on Adverse Events, Morbidity, Mortality, and Medical Costs.*  Nursing Research, 52(2), 71-79.

- A 2002 report by Blue Cross Blue Shield Association found that California hospitals could save over $331 million if all hospitals performed at the level of the best hospitals in the state in terms of these quality indicators: adverse events, wound infection, pneumonia after surgery, and urinary tract infections. These indicators are well-established measures of nurse staffing.  Kane, Nancy, and Richard B. Siegrist, Jr., “Understanding Rising Hospital Inpatient Costs: Key Components of Cost and the Impact of Poor Quality”, August 2002.


- While immediate personnel costs are less with short staffing, long term costs were higher because patients with complications often stay longer in the hospital and require other expensive treatments.  Flood, S.D. and Diers, D.  *Nurse staffing, patient outcome and cost.*  Nursing Management, 19(5): 34-43, 1998.

- Institutions attempting to decrease costs through health care worker reductions may, in the final analysis, incur higher costs as a result of higher rates of nosocomial infection, longer hospital stays and use of expensive antimicrobials and increased mortality.  Archibald, L.K.; Manning, M.L.; Bell, L.M.; Banerjee, S.; and Jarvis, W.R.  *Patient density, nurse-to-patient ratio and nosocomial infection risk in a pediatric intensive care unit.*  Ped Infectious Dis J, 16(11): 1045-48, 1997.