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## A Summary of Nurse Staffing Studies: Impact on Patient Outcomes, Costs, Patient & Nursing Satisfaction

**Patient Deaths:** A one-patient increase in a nurse's workload increased the likelihood of an in-patient death within 30 days of admission by 7 percent.<sup>i</sup> Mortality risk decreases by 9 percent for ICU patients and 16 percent for surgery patients with the increase of one FTE RN per patient day.<sup>ii</sup> Nurse staffing shortages are a factor in one out of every four unexpected hospital deaths or injuries caused by errors.<sup>iii</sup>

**Medical Errors:** A study of medication errors in two hospitals found that nurses were responsible for intercepting 86 percent of all medication errors made by physicians, pharmacists and others before the error reached the patient.<sup>iv</sup>

**Complications and Infections:** Facilities with nurse staffing levels in the bottom 30 percent were more likely to be among the worst 10 percent for heart failure, electrolyte imbalances, sepsis, respiratory infection and urinary track infections.<sup>v</sup> Lower nurse staffing levels led to higher rates of blood infections, ventilator-associated pneumonia, 30-day mortality, urinary tract infections and pressure ulcers.<sup>vi</sup> Large patient loads and high levels of exhaustion among nurses were associated with greater rates of urinary-tract and surgical-site infections.<sup>vii</sup> As nurse staffing levels increase, patient risk of hospital acquired complications and hospital length of stay decrease, resulting in medical cost savings, improved national productivity, and lives saved.<sup>viii</sup>

**Readmissions:** Each one-patient increase in a hospital's average staffing ratio increased the odds of a medical patient's readmission within 15-30 days by 11 percent. The odds of readmission for surgical patients increased by 48 percent.<sup>ix</sup>

**Patient Satisfaction:** Patients care for on units characterized as having adequate staff were more than twice as likely to report high satisfaction with their care and their nurses reported significantly lower burnout.<sup>x</sup> Patient satisfaction scores were significantly higher in hospitals with better nurse to patient ratios. There was a 10 point difference in the % of patients who would definitely recommend the hospitals – depending on whether patients were in a hospital with a good work environment for nurses.<sup>xi</sup>

**Burnout and turnover:** In August 2012, approximately one third of nurses reported an emotional exhaustion score of 27 or greater, considered by medical standards to be "high burnout."<sup>xii</sup> Each additional patient per nurse (above 4) is associated with a 23 percent increase in the odds of nurse burnout.<sup>xiii</sup>

**Lower costs:** A 2009 study found that adding an additional 133,000 RNs to the U.S. hospital workforce would produce medical savings estimated at \$6.1 billion in reduced patient care costs.<sup>xiv</sup>

**Reduced workers' compensation and nurse injuries:** A study done on California's workers' compensation for RNs pre- and post-California's staffing mandate found occupational illness and injury rates for RNs fell by almost 32 percent.<sup>xv</sup>

<sup>i</sup> Aiken, Linda H., et.al, "Nurse Staffing and Education and Hospital Mortality," The Lancet, February 2014

<sup>ii</sup> Kane, Robert L. et.al. "Nurse Staffing and Quality of Patient Care," AHRQ Publication No. 07-E005, Evidence Report/Technology Assessment # 151, March 2007

<sup>iii</sup> Joint Commission on the Accreditation of Hospital Organizations, 2002.

<sup>iv</sup> Leape, Lucian, et.al. "system analysis of adverse drug events." Journal of the American Medical Association, 274(1): 35-43.

<sup>v</sup> Hughes, Ronda G., "Patient Safety and Quality: An Evidence-Based Handbook for Nurses, (Rockville, MD: Agency for Healthcare Research and Quality, 2008.)

<sup>vi</sup> Stone, Patricia W. et.al., Nurse Working Conditions and Patient Safety Outcomes, Medical Care, Volume 45, Number 6, June 2007

<sup>vii</sup> Cimiotti, Jeannie P. et.al, "Nurse Staffing, Burout and Health Care Associated Infections," American Journal of Infection Control 40.6 (August 2012).

<sup>viii</sup> (Dall T., Chen Y., Seifert R., Maddox P. & Hogan P. (2009) The economic value of professional nursing. Medical Care 47, 97-103.)

<sup>ix</sup> Tubbs Cooley, et al. "Nurses working conditions and hospital readmission among pediatric surgical patients." BMI Quality and Safety in Health Care, 2012.

<sup>x</sup> Vahey, Doris C. et al. Nurse Burnout and Patient Satisfaction, Med Care, 2004, February 412 (Suppl) 1157-1166



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- <sup>xi</sup> Kutney-Lee, Ann et.al. Nursing: A Key to Patient Satisfaction. *Health Affairs*. July/August 2009, vol. 28, no. 4 669-677.
- <sup>xii</sup> Cimiotti, Jeannie P. et.al. "Nurse staffing, burnout and healthcare associated infection." *American Journal of Infection Control*, 40:6 (August 2012)
- <sup>xiii</sup> Aiken, Linda et al. "Hospital Nurse Staffing and Patient Mortality, Nurse Burnout and Job Dissatisfaction." *Journal of the American Medical Assn*, 10/2002)
- <sup>xiv</sup> Dall, Timothy M. et al. "The Economic Value of Professional Nursing Medical Care. January 2009, 47:1, pp. 97-104.
- <sup>xv</sup> Leigh, P., Markis, C., Iosif, A-M., Romano, P. "California's Nurse-to-Patient Ratio Law and Occupational Injury." *International Archives of Occupational and Environmental Health*. 13 September 2014.