

SUSPENSION

McCarthy, Karen

From: sarah buckley <sbuckley@CWA1168.ORG>
Sent: Monday, December 14, 2015 5:53 PM
To: McCarthy, Karen
Subject: Research Citations and Summary on Safe Staffing

Hi Karen, Nice meeting you Thursday. Please pass this along to the legislators. Sincerely, Sarah
Dear Erie County Legislators,

Thank you so much for your attentive listening and insightful questions. As requested I am sending you the citations for the studies I referenced on Thursday.

I have divided the research into three sections – A. Saving Lives; B. Preventing Adverse Events and Outcomes; C. Cost-savings and D. Non-nurse Staff.

Any questions, don't hesitate to call. 716-713-7780.

A. Safe Staffing Saves Lives. (The first and third studies are particularly important they both look at over 20 different studies different studies, so you don't have to read 20+ studies.)

1. The Association of Registered Nurse Staffing Levels and Patient Outcomes: Systematic Review and Meta-Analysis. Kane RL, Shamliyan TA, Mueller C, Duval S, Wilt TJ. Med Care. 2007 Dec;45(12):1195-204.

One analysis of 28 studies, found a consistent relationship between higher RN staffing and lower hospital-related mortality (Death essentially). Adding one RN per patient day was associated with a 9% reduction in odds of death for ICU patients and a 6% reduction for medical patients. It was also associated with a 16% decrease in failure to rescue in surgical patients. Failure to Rescue means that a condition that could have been caught earlier was not and led to death or permanent disability.

<http://www.ncbi.nlm.nih.gov/pubmed/18007170>

2. Nurse Staffing and Inpatient Hospital Mortality. Jack Needleman, Ph.D., Peter Buerhaus, Ph.D., R.N., V. Shane Pankratz, Ph.D., Cynthia L. Leibson, Ph.D., Susanna R. Stevens, M.S., and Marcelline Harris, Ph.D., R.N.. New England Journal of Medicine 2011; 364:1037-1045. March 17, 2011

Another study, which included nearly 200,000 hospitalizations across 43 hospital units, found that the risk of death rose by 2% for each shift the nurse staffing was below target levels.

<http://www.nejm.org/doi/full/10.1056/NEJMsa1001025>

3. Nurse staffing and patient outcomes in critical care: a concise review. Penoyer DA1. Critical Care Medicine. 2010 Jul;38(7):1521-8; quiz 1529.

An annotated review of major nursing and medical literature from 1998 to 2008 found 26 research studies conducted in intensive care units or critical care populations where nurse staffing and patient outcomes were addressed. Most studies suggested that decreased nurse staffing is associated with adverse outcomes in intensive care unit patients.

4. Nurse Staffing and Quality of Care with Direct Measurement of Inpatient Staffing. Harless DW1, Mark BA. Medical Care. 2010 Jul;48(7):659-63.

A longitudinal study found that an increase of one RN per 1,000 inpatient days was associated with a 4.3% drop in mortality.

<http://www.ncbi.nlm.nih.gov/pubmed/20548254>

B. Preventing Adverse Events and Outcomes

1. Again, there are so many studies to cite I have included below a table from the report that was included in your packet, All Hands on Deck, about nurse-staffing's effect on various patient conditions.

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An article I find particularly disturbing from the *Journal of the American Medical Association* found the an association between low nurse staffing and infections in the youngest and smallest of patients, low-birth weight infants. Based on the model from the study, they found that a unit with no understaffing, the predicted infection rate was 9%. At the 90th percentile of understaffing (0.22 of a nurse per infant), the infection rate was 21%. <http://archpedi.jamanetwork.com/article.aspx?articleid=1669323#RESULTS>

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<p>RESPIRATORY FAILURE Acute respiratory distress syndrome (“ARDS”) occurs when fluid builds up in the lungs’ tiny air sacs, impairing oxygen supply to the bloodstream. It can be caused by sepsis (a serious, widespread blood infection); severe pneumonia; or inhaling (aspirating) vomit.⁴⁹</p>	<p>An increase by 1 RN per patient day was associated with a decreased odds ratio for respiratory failure (60% in ICUs);⁵⁰</p>
<p>FALLS Falls are surprisingly common in hospitals – up to 12% of patients fall at least once.⁵¹ At special risk: People with gait instability; leg weakness; urinary frequency or incontinence; agitation or confusion; and prescription of certain drugs.⁵²</p> <p>A patient may be at chronic risk or may undergo “transient risk” due to surgery or illness. NQF lists “falls prevalence” and “falls with injury” as 2 of its 8 patient-centered outcome measures for “nursing-sensitive care.”⁵³</p>	<p>- While a 2007 meta-analysis did not find consistent links between increased RN nurse staffing and fewer falls in hospitals,⁵⁴ subsequent studies generally have found a significant relationship.</p> <p>- A 2012 study found that lower nursing hours per patient day (<i>total nursing care</i>) accounted for 13% of the variance in falls. Nursing hours per patient day were significantly associated with “missed nursing care” (specific tasks), and even if specific “missed nursing care” such as patient ambulation were supplied, the impact of nursing hours still accounted for 8.3% of the variance in falls.⁵⁵</p>
<p>OTHER ADVERSE EVENTS linked to staffing include unplanned extubation, shock, upper gastrointestinal bleeds.</p> <p>Also, an increase in <i>total nursing care</i> (RNs, LPNs and aides) was linked to fewer incidents of prolonged length of stay.⁵⁶</p>	<p>- An increase by 1 RN per patient day was linked to 15% lower odds for unplanned extubation in ICUs.⁵⁷</p> <p>- Data from 799 hospitals in 11 states revealed that hospitals with worse RN nurse-to-patient ratios had higher rates of shock and upper gastrointestinal bleeds.⁵⁸</p> <p>- An increase of 1% in RN nurse staffing reduced the number of adverse events by 3.4%, and a 5% increase reduced adverse events by 15.8%.⁵⁹</p>

⁴⁷ R. Kane, *et al.*, *supra*, pp. 1195 and 1197-98.
⁴⁸ J. Needleman, *et al.* (2002), *supra*.
⁴⁹ Mayo Clinic Staff, “ARDS: Causes” (<http://www.mayoclinic.org/diseases-conditions/ards/basics/causes/con-20030070>); Mayo Clinic Staff, “ARDS: Risk Factors” (<http://www.mayoclinic.org/diseases-conditions/ards/basics/risk-factors/con-20030070>).
⁵⁰ R. Kane, *et al.*, *supra*, pp. 1195 and 1197-98.
⁵¹ J. Coussement, *et al.*, “Interventions for Preventing Falls in Acute- and Chronic-Care Hospitals: A Systematic Review and Meta-Analysis,” *J Am Geriatr Soc* 56(1):29-36 (2008).
⁵² D. Oliver, *et al.*, “Risk Factors and risk Assessment Tools for Falls in Hospital I-Patients: A Systematic Review,” *Age and Ageing* 33(2):122-130, 124 (2004).
⁵³ National Quality Forum, *National Voluntary Consensus Standards for Nursing-Sensitive Care* (2004), *supra*.
⁵⁴ R. Kane, *et al.*, *supra*. A study of 2004 data for over 600 hospitals found that adding one RN hour/patient day was associated with a 3% lower fall rate in ICUs and 2% lower rate hospital-wide, but questioned if higher patient acuity may have affected the change. E. Lake, *et al.*, “Patient Falls: Association with Hospital Magnet Status and Nursing Unit Staffing,” *Res Nurs Health* 33(5):413-25 (2010).
⁵⁵ B. Kalisch, *et al.*, “Missed Nursing Care, Staffing, and Patient Falls,” *J Nurs Care Quality* 27(1):6-12 (Jan/Mar 2012). *See also*, N. Dunton, *et al.*, “Nurse Staffing and Patient Falls on Acute Care Hospital Units,” *Nurs Outlook* 52(1):53-59 (Feb. 2004).
⁵⁶ V. Staggs and J. He, *supra*, p. 391 (data based on adult ICUs and general care units).
⁵⁷ R. Kane, *et al.*, *supra*, pp. 1195 and 1197-98.
⁵⁸ J. Needleman, *et al.* (2002), *supra*. (This study was based on data from 799 hospitals in 11 states.)
⁵⁹ K. Frith, *et al.*, “Effects of Nurse Staffing on Hospital-Acquired Conditions and Length of Stay in Community Hospitals,” *Quality management in Health Care* 19:147-55 (2010). This study examined data on nearly 35,000 patients from 11 medical-surgical units in four hospitals over a two-year period.

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C. **Costs:** The following are three studies that look at the costs and benefits of safe staffing. Below them is a table also from the report included in your packets, "All Hands on Deck" that reviews cost-savings associated with safe staffing. The way I look at the issue of cost generally is, 'what is the cost of *not* adequately staffing our hospitals?'

1. Improving nurse-to-patient staffing ratios as a cost-effective safety intervention. Rothberg MB1, Abraham I, Lindenauer PK, Rose DN. *Med Care*. 2005 Aug;43(8):785-91.

This study found that dropping the number of patients per nurse from seven to six cost \$63,900 per life saved, and from six to five cost \$92,800 per life saved. Even the incremental cost-effectiveness of a ratio of 1:4 did not exceed \$136,000 per life saved. By way of comparison, it noted that thrombolytic therapy (the breakdown of blood clots by pharmacological means) in a case of acute myocardial infarction (heart attack) costs \$182,000 per life.

http://journals.lww.com/lww-medicalcare/Abstract/2005/08000/Improving_Nurse_to_Patient_Staffing_Ratios_as_a.6.aspx

2. Cost savings associated with increased RN staffing in acute care hospitals: Simulation exercise. by Tatyana A. Shamliyan, M.D., M.S., Robert L. Kane, M.D., Christine Mueller, Ph.D., R.N., and others in *Nursing Economics* 27(5), pp. 302-331, 2009.

This study looked at a cost to benefit ratio for lives saved by safe staffing. The monetary benefit of saved lives per 1,000 hospitalized patients was 2.5 times higher than the increased cost of one additional full-time nurse per patient day in the ICU. It was 1.8 times higher in surgical units and 1.3 times higher in medical units.

<http://archive.ahrq.gov/news/newsletters/research-activities/jun10/0610RA21.html>

3. US Department for Health and Human Services' Agency for Healthcare Research and Quality Study Links Hospital Nurse Staffing Increases to Fewer Adverse Events, Lower Lengths of Stay

Examining the Value of Inpatient Nurse Staffing: an Assessment of Quality and Patient Care Costs. Martsolf GR1, Auerbach D, Benevent R, Stocks C, Jiang HJ, Pearson ML, Ehrlich ED, Gibson TB. *Med Care*. 2014 Nov;52(11):982-8. doi: 10.1097/MLR.0000000000000248.

Increases in hospital nurse staffing levels are associated with reductions in adverse events and lengths of stay and do not lead to increased costs, a longitudinal study by AHRQ concluded. Researchers also found that increasing the number of registered nurses, led to reduced costs. The findings suggest that increased staffing of registered nurses can improve patient outcomes and efficiency.

<http://www.ncbi.nlm.nih.gov/pubmed/25304017>

COST-SAVING IMPROVEMENTS LINKED TO NURSING STAFF LEVELS

Cost-saving Improvement	Evidence for link to nursing staff levels
<p>Fewer “avoidable adverse events” Since 2008, CMS’s rules have required it to deny payment for care related to any of 8 conditions that should never occur (so-called “never events”). These include pressure ulcers, falls with injury, catheter-associated urinary tract infections, vascular catheter associated infections, pressure ulcers and falls with injury.¹⁵²</p>	<ul style="list-style-type: none"> - Part One of this report notes the association between staffing and avoidable adverse outcomes. - A 10% increase in a hospital’s “high–burnout nurses” was associated with an increase of nearly one urinary tract infection and two surgical site infections per 1,000 patients. Hospitals in which burnout was reduced by 30% had a total of 6,239 fewer infections, for an annual cost saving of up to \$69 million.¹⁵³
<p>Fewer “potentially preventable readmissions” (“PPR”) The Affordable Care Act penalizes hospitals with excessive readmission rates. The link to nurse staffing may be related to lack of time for patient training. Researchers found “a path of significant associations from RN staffing to patient-reported quality of discharge teaching, from quality of discharge teaching to patient-reported discharge readiness, and from discharge readiness to post-discharge ED use.”¹⁵⁴</p>	<ul style="list-style-type: none"> - Hospitals with lower RN staffing levels had 25% worse odds of being penalized for PPRs than comparable hospitals with higher levels.¹⁵⁵ - Increasing RN staffing by 0.75 hours-per-patient day was linked with a 4.4 percentage point drop in probability of readmission, while a rise in RN overtime hours increased the probability of an Emergency Department visit post-discharge.¹⁵⁶ - A survey of California nurses found satisfaction with “time for patient education” improved significantly from 2004 to 2006.¹⁵⁷
<p>Fewer Workers Compensation Claims Workplace strain and injury among healthcare staff can affect productivity, lost work days and staff turnover.</p>	<ul style="list-style-type: none"> - The California ratios were associated with 55.57 fewer occupational injuries and illnesses per 10,000 RNs per year, 31.6% lower than expected based on national averages, and the reduction for LPNs was 33.6% lower than expected.¹⁵⁸
<p>Reduced length of stay and litigation due to prevention of harm Implementing safe staffing levels can reduce a patient’s length of stay. Also, implementing safe staffing levels can reduce a facility’s risk of liability due to successful prevention of harm – both to patients and to staff.</p>	<ul style="list-style-type: none"> - RN hours were inversely related to developing pneumonia, a complication that added 5.1 to 5.4 days to a hospital length of stay and \$22,390 to \$28,505 to hospital costs.¹⁵⁹ - By comparison, nursing homes meeting the recommended staffing levels for RNs had a 23% lower rate of litigation; and those that did so for CNAs had a 15% lower litigation rate.¹⁶⁰
<p>Reduced staff turnover costs Researchers state it would be “revenue neutral” to offer each departing nurse “a <i>staying bonus</i> equal to 86% of his or her annual salary or give <i>every</i> nurse on staff a 33% retention supplement <i>every year</i>” (<i>emphasis in original</i>).¹⁶¹</p>	<ul style="list-style-type: none"> - In hospitals with low nurse-to-patient ratios, nurses were more likely to experience burnout.¹⁶² - Hospitals with low nurse retention rates spend, on average, \$3.6 million more than hospitals with high retention rates.¹⁶³

¹⁵² The regulations, implemented in October 2008, also included blood incompatibility reactions and certain other errors.

¹⁵³ J. Cimiotti, *et al.*, *supra*.

¹⁵⁴ M. Weiss, *et al.* (2011), *supra*, pp. 1483-86. This study involved nearly 1900 patients and four acute care hospitals.

¹⁵⁵ M. McHugh, *et al.*, “Hospitals with Higher Nurse Staffing Had Lower Odds of Readmissions Penalties Than Hospitals with Lower Staffing,” *Health Aff* 21(10):1740-1747 (2013). This was a study of data from 2,826 hospitals.

¹⁵⁶ M. Weiss, *et al.* (2011), *supra*, pp. 1483-86.

¹⁵⁷ J. Spetz, “Nurse Satisfaction and the implementation of Minimum Nurse Staffing Regulations,” *Policy, Politics & Nurs pract* 20(20):1-7 (2008), p. 4.

¹⁵⁸ J. Leigh, *et al.*, *supra*.

¹⁵⁹ S. Cho, *et al.*, “The Effects of Nurse Staffing on Adverse Events, Morbidity, Mortality, and Medical Costs,” *Nurs Res* 52:71-79 (2003).

¹⁶⁰ C. Johnson, *et al.*, “Predicting Lawsuits Against Nursing Homes in the United States, 1997-2001,” *Health Serv Res.* 39 (6, Part 1):1713-31 (2004). This study examined data for nursing homes in 45 states.

¹⁶¹ J. Waldman, *et al.*, “the Shocking Cost of Turnover in Health Care,” *Health Care Manage Rev* 29(1):2-7, 6-7 (2004).

¹⁶² L. Aiken, *et al.*, *supra*.

¹⁶³ PricewaterhouseCoopers Health Research Institute (2007), *supra*, p. 1.

D. Unlicensed Assistive Personnel and Support Staff: There is a claim by those in opposition to this bill that non-nurse staff, such as nurse’s aides and housekeeping will be laid off. There is very little data on this topic.

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Implications of the California Nurse Staffing Mandate to Other States. Linda H Aiken, Douglas M Sloane, Jeannie P Cimiotti, Sean P Clarke, Linda Flynn, Jean Ann Seago, Joanne Spetz, and Herbert L Smith. Health Serv Res. 2010 Aug; 45(4): 904–921. This study was based on 80,000 hospital staff nurse surveys. 73% of respondents reported that levels of support staff- such as housekeeping and clerks either stayed the same or increased. 66% of respondents reported that the levels of unlicensed assistive personnel – such as nursing assistants increased or stayed the same

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2908200/>

Any questions, don't hesitate to call.

Sincerely,

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