SB284 Patient Safe Staffing Act

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5 key issues I will discuss relevant to SB 284

1. Nursing is complex, cognitively and managerially challenging work, a fact not appreciated by public or frankly all health care executives
2. Nurse staffing matters: there is extensive evidence that nurse staffing levels influence patient safety and outcomes such as death and hospital acquired complications
3. Patients are entitled to nurse staffing at levels that assure safe and reliable care
4. Higher, safer staffing is affordable
5. The right staffing levels vary from hospital to hospital and unit to unit, and is not one size fits all, so hospital-staff jointly developed staffing models are good approach to assuring right staffing

Nurses' work is cognitively, intellectually and managerially challenging work

- Public understands nursing is physically and emotionally demanding, but too little appreciation that work of front line nurses is cognitively, intellectually and managerially complex
- Stereotype of nurses: deliver ordered care, administer drugs, take vital signs, help patients eat, go to the bathroom, bath
    - They do and this is part of fundamentals of nursing care, but...

The cognitive work of nurses

- Cognitive and intellectual demands of work:
  - Backstop rest of care system:
    - Check for errors in orders, especially drugs
    - If something ordered, not delivered, follow up
    - Responsible for preventing errors of commission and omission
  - Monitor and assess patients
    - For risks of falls, pressure ulcers, delirium and disorientation
    - Progress as expected or problems or developing complications
    - Pain
    - Mental status, especially depression and agitation
  - Initiate appropriate interventions for prevention or treatment to keep patient, staff and others safe

The cognitive work of nurses

- Often principal coordinators of interprofessional teams that include physicians, pharmacists, social workers and other providers
- Targeted education for patients and families to prepare for safe discharge and reduce the risk of readmission
- Emotional, psychological and existential support for patients and their families

Nurses create and work within a therapeutic relationship with the patient that has physical, psychosocial and relational dimensions

Fundamentals of Care
A positive statement of what well-delivered care looks like

Table 1. Fundamentals of Care Template

Fundamental of Care	Patient Experience
Safety, prevention and medication	
Communication and education	
Respiration	
Eating & Drinking	
Elimination	
Personal cleansing & dressing	
Temperature control	
Rest & sleep	
Comfort (including pain management)	
Dignity	
Privacy	
Respecting Choice	
Mobility	
Expressing sexuality	

Table derived from Kitson, Robertson-Malt, & Conroy, (2013), reprinted with permission)
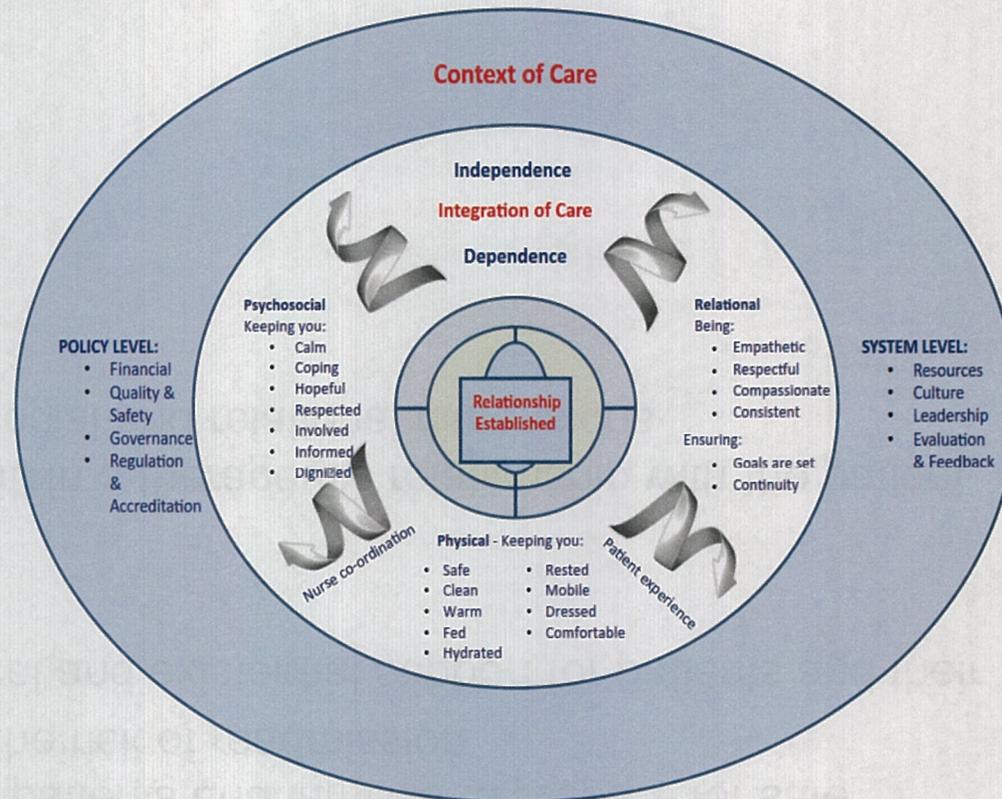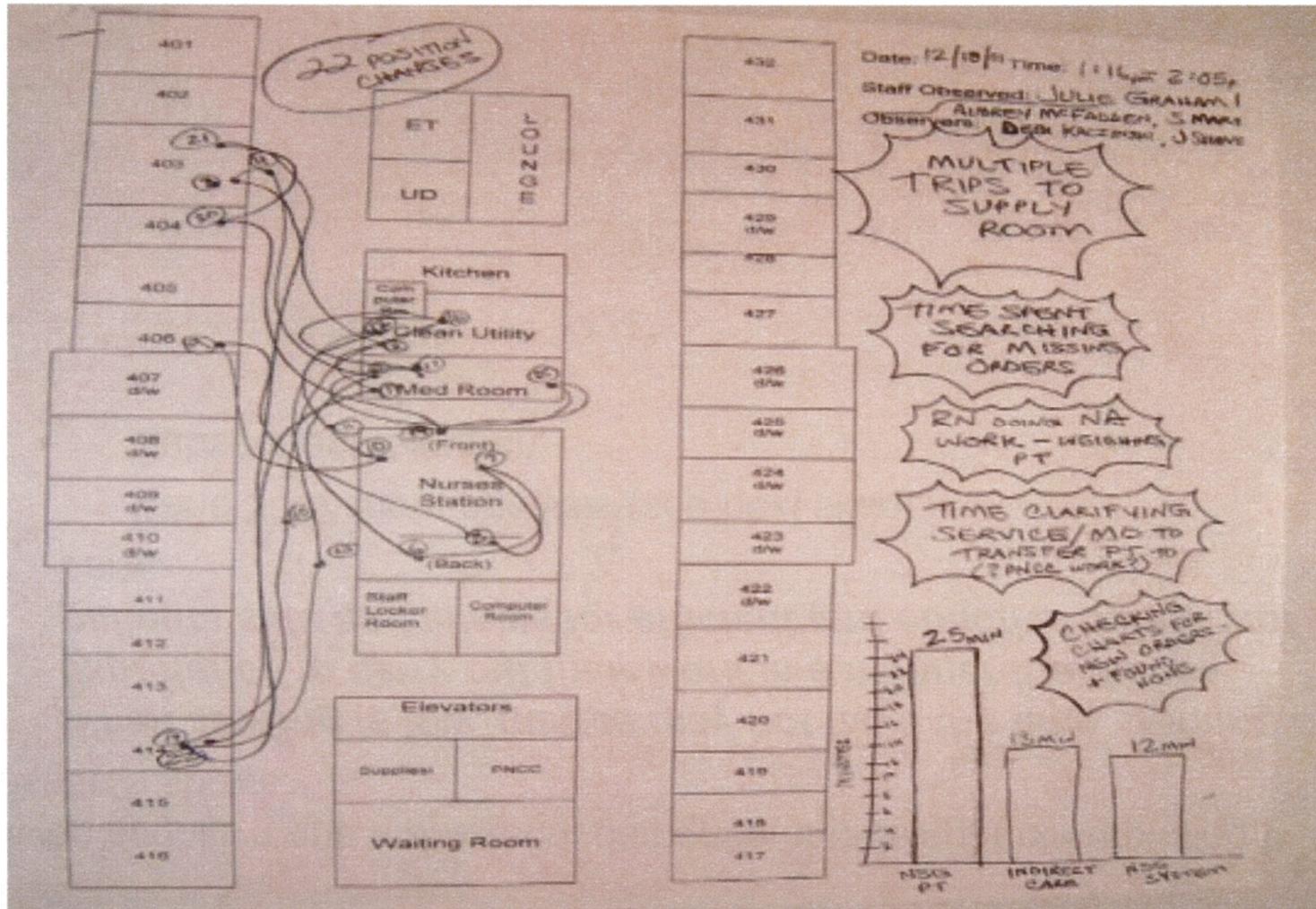

Figure 1. The fundamentals of care framework: Relational, integrative and contextual dimensions (Source: Kitson, Conroy, Kuluski, Locock, & Lyons (2013), reprinted with permission).

Source: Kitson, A. L., A. Muntlin Athlin, and T. Conroy. "Anything but Basic: Nursing's Challenge in Meeting Patients' Fundamental Care Needs." *J Nurs Scholarsh 46.5 (2014): 331-9.*

One nurse, 50 minutes of one shift, 22 position changes

Source, Institute for Healthcare Improvement, TCAB How-to Manual on Nurse Time in Direct Patient Care, 2008

There is extensive evidence that nurse staffing levels influence patient safety, adverse outcomes and length of stay

- Given cognitive and managerial demands of nursing, not surprising that research shows:
  - *When staffing is low, nurses may not have the time, training or experience to carry out their work in a manner that keeps patients safe and allows for efficient and effective delivery of care.*
    - Kane 2007 meta-analysis (see next slide)
    - Subsequent research

Meta-Analysis of Nurse Staffing Studies

TABLE 1. Pooled Odds Ratios of Patient Outcomes Corresponding to an Increase of 1 Registered Nurse Full Time Equivalent per Patient Day*

Outcome	Studies	Odds Ratio (95% CI)	Attributable to Nurse Staffing Fraction of Events (%)	No. Avoided Events/1000 Hospitalized (95% CI)
All patients				
Mortality, hospital level analysis, all patients	5	0.96 (0.94; 0.98)	4.2	3 (2; 4)
Mortality, intensive care units	5	0.91 (0.86; 0.96)	9.2	5 (2; 8)
Mortality, surgical patients	8	0.84 (0.8; 0.89)	16	6 (4; 8)
Mortality, medical patients	6	0.94 (0.94; 0.95)	5.6	5 (4; 5)
Hospital-acquired pneumonia	4	0.81 (0.67; 0.98)	19.1	1 (0; 2)
Pulmonary failure	5	0.94 (0.94; 0.94)	6	1 (1; 1)
Cardiopulmonary resuscitation	5	0.72 (0.62; 0.84)	27.6	2 (1; 2)
Intensive care units				
Hospital-acquired pneumonia	3	0.7 (0.56; 0.88)	30.2	7 (3; 10)
Pulmonary failure	4	0.4 (0.27; 0.59)	60.3	7 (5; 9)
Unplanned extubation	5	0.49 (0.36; 0.67)	50.9	6 (4; 8)
Cardiopulmonary resuscitation	3	0.72 (0.62; 0.84)	27.6	2 (1; 2)
Relative change in length of stay	4	0.76 (0.62; 0.94)	24	7 (2; 11)
Surgical patients				
Failure to rescue	5	0.84 (0.79; 0.9)	16	26 (17; 35)
Surgical wound infection	1	0.15 (0.03; 0.82)	84.5	7 (1; 8)
Cardiopulmonary resuscitation	1	0.72 (0.62; 0.84)	27.6	1 (1; 2)
Nosocomial bloodstream infection	5	0.64 (0.46; 0.89)	36	4 (2;5)
Relative change in length of stay	3	0.69 (0.55; 0.86)	31	14 (6; 21)

*An increase of 1 registered nurse full time equivalent per patient day would result in 8 additional registered nurse hours per patient day and an increased cost of $24.57/h × 8 h or $196.56/patient day.[122] Attributable to nurse staffing fraction of events and number of avoided events per 1000 hospitalized patients were estimated assuming causality in the association.

Source: Kane et al, Medical Care, 2007

Pooled Odds Ratios of Patient Outcomes Corresponding to an Increase of 1 Registered Nurse Full Time Equivalent per Patient Day

Outcome	Studies	Odds Ratio
Mortality, hospital, all patients	5	0.96
Mortality, intensive care units	5	0.91
Mortality, surgical patients	8	0.84
Mortality, medical patients	6	0.94
Hospital-acquired pneumonia	4	0.81
Cardiopulmonary resuscitation	5	0.72
Surgical patients failure to rescue	5	0.84
Surgical wound infection	1	0.15
Nosocomial bloodstream infection (Surgical)	5	0.64
Relative change in length of stay (Surgical)	3	0.69

All ORs significant at 0.05 level

OR below 1.0 positive effect of nursing on outcome

OR of 0.9 implies a reduction of risk of approximately 10%

Source: Kane, 2007

Since Kane, 2007

- Replication of results for outcomes observed
- Addition of other outcomes, notably readmissions
- Additional international work finding association
  - Aiken, L. H., et al. "Nurse Staffing and Education and Hospital Mortality in Nine European Countries: A Retrospective Observational Study." *Lancet 383.9931 (2014): 1824-30. Print.*
  - Griffiths, P. "Staffing Levels and Patient Outcomes." *Nurs Manag (Harrow) 16.6 (2009): 22-3. Print.*
  - Twigg, D. E., et al. "Is There an Economic Case for Investing in Nursing Care--What Does the Literature Tell Us?" *J Adv Nurs 71.5 (2015): 975-90. Print.*

The association of staffing and outcomes is causal

- Because much research finding association of staffing and outcomes compares high staffed to low staffed hospitals, some skeptics raise question of whether it is staffing or something else about high staffed hospitals that causes these correlations
- However, three strands of evidence help demonstrate these associations are causal
  - Extensive controls for technology, teaching, location, accreditation, ownership and patient status in the multiple studies of stafifng and outcomes
    - The "something else's" are controlled for
  - Needleman 2006 NEJM study of shift-to-shift variations in staffing within a single high quality institution controls for other variables except nurse staffing
    - Lower than target staffing associated with higher mortality
  - Increased modeling of pathways by which staffing levels can influence adverse events
    - Especially missed care

What we measure is often missed care, the failure to deliver needed care

- 4 instruments of note:
  - US Hospital Consumer Assessment of Healthcare Providers and Surveys
  - Kalisch MISSCARE – Patient Survey
  - Kalisch MISSCARE
    - Nurse report of how often elements of care missed on unit
  - Basel Extent of Rationing of Nursing Care (BERNCA) survey
    - Identification of care missed by surveyed nurse
    - Modified version used in RN4CAST European studies
- Domains included:
  - Assistance with activities of daily living
  - Caring and emotional support
  - Rehabilitation, instruction and education
  - Monitoring and safety
  - Delivery of ordered care and documentation

Kalisch MISSCARE - Patient

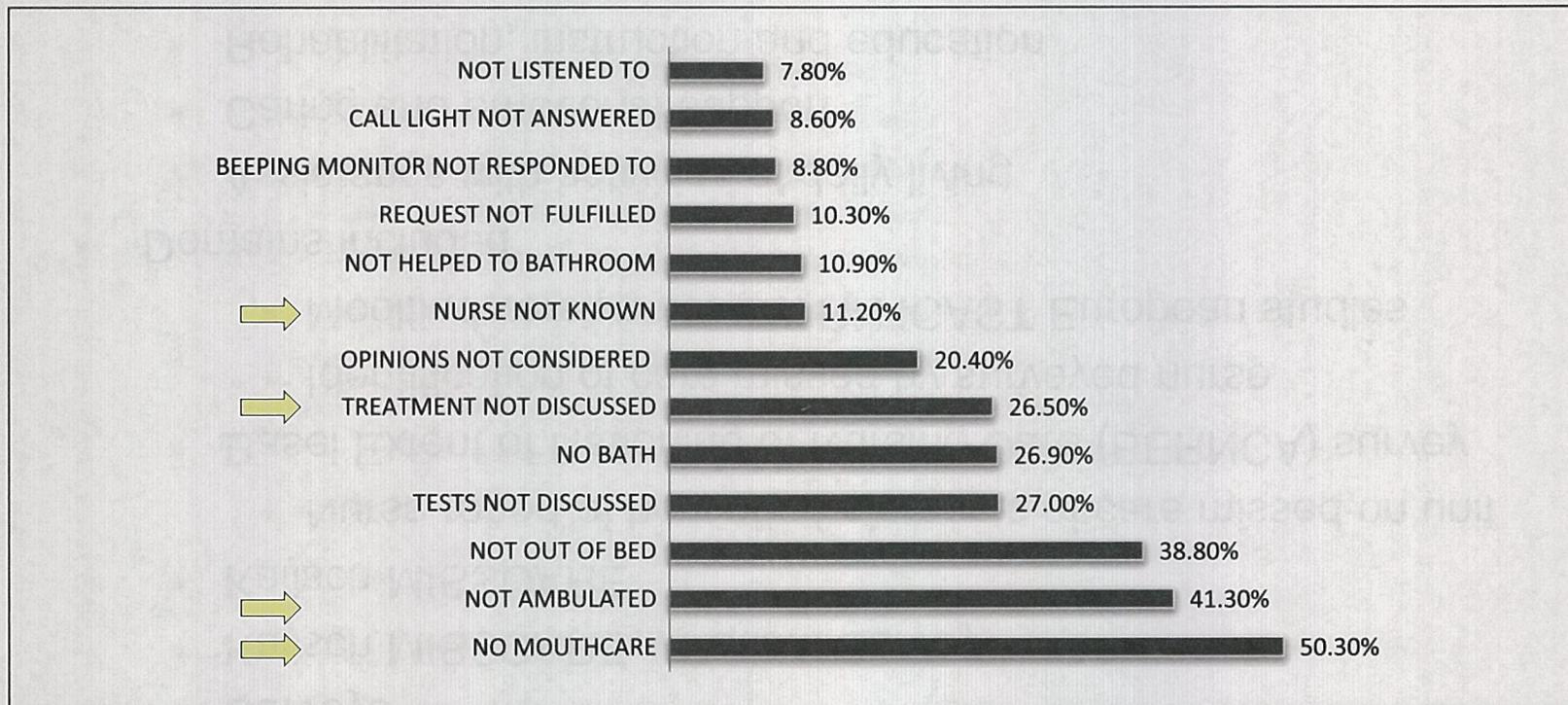| Missed element	Percentage
NOT LISTENED TO	7.80%
CALL LIGHT NOT ANSWERED	8.60%
BEEPING MONITOR NOT RESPONDED TO	8.80%
REQUEST NOT FULFILLED	10.30%
NOT HELPED TO BATHROOM	10.90%
NURSE NOT KNOWN	11.20%
OPINIONS NOT CONSIDERED	20.40%
TREATMENT NOT DISCUSSED	26.50%
NO BATH	26.90%
TESTS NOT DISCUSSED	27.00%
NOT OUT OF BED	38.80%
NOT AMBULATED	41.30%
NO MOUTHCARE	50.30%

Figure 2. Missed elements of nursing care (N = 729).

Kalisch, et al., "Patient-Reported Missed Nursing Care Correlated With Adverse Events," American Journal of Medical Quality, 2014; 29(5):415-422.

Kalisch MISSCARE

Table 3. Study 1 (n = 459) and Study 2 (n = 639); Part A Missed Nursing Care Percentages

Item A	Study 1	Study 2
	Missed Care, %[a]	
Ambulation 3 times per day or as ordered	83.6	88.7
Assess effectiveness of medications	83.1	65.4
Turning patient every 2 h	82.4	68.8
Mouth care	81.9	82.6
Patient teaching about procedures, tests, and other diagnostic studies	80.4	68.7
PRN medication requests acted on within 15 min	80.3	54.0
Full documentation of all necessary data	79.3	73.9
Feeding patient when the food is still warm	76.4	78.5
Medications administered within 30 min before or after scheduled time	74.6	66.0
Assist with toileting needs within 5 min of request	69.5	65.1
Response to call light is initiated within 5 min	65.5	69.6
Emotional support to patient and/or family	65.4	58.3
Patient bathing/skin care	63.1	57.7
IV/central line site care and assessments according to hospital policy	61.9	54.0
Teach patient about plans for their care after discharge and when to call after discharge	57.6	28.4
Monitoring intake/output	57.0	54.6
Setting up meals for patient who feed themselves	50.3	50.8
Vital signs assessed as ordered	40.0	28.3
Focused reassessments according to patient condition	36.9	30.9
Hand washing	30.2	48.4
Bedside glucose monitoring as ordered	26.1	25.0
Patient assessments performed each shift	17.0	13.0

[a]Percentage of missed care used categories of occasionally, frequently, and always.

Kalisch, B. J. and R. A. Williams. 2009. "Development and psychometric testing of a tool to measure missed nursing care." *J Nurs Adm* 39(5): 211-9.

Studies find:
Lower staffing associated with more missed care
Missed care associated with adverse outcomes and longer stays

- Studies showing relationship between staffing and care
  - Dabney, B. W. and B. J. Kalisch. 2015. "Nurse Staffing Levels and Patient-Reported Missed Nursing Care." *J Nurs Care Qual.*
  - Jha, A. K., E. J. Orav, J. Zheng, and A. M. Epstein. 2008. "Patients' Perception of Hospital Care in the United States." *New England Journal of Medicine 359: 1921-31.*
- Studies showing relationship between care and outcomes
  - Schubert, M., S. P. Clarke, L. H. Aiken, and S. De Geest. 2012. "Associations between rationing of nursing care and inpatient mortality in Swiss hospitals." *International Journal for Quality in Health Care 24(3): 220-38.*
- Studies showing care and missed care mediates relationship between staffing and outcomes
  - Ball, J. E., T. Murrells, A. M. Rafferty, E. Morrow, and P. Griffiths. 2014. "'Care left undone' during nursing shifts: associations with workload and perceived quality of care." *BMJ Qual Saf 23(2): 116-25.*
  - Bruyneel, L., B. Li, D. Ausserhofer, E. Lesaffre, I. Dumitrescu, H. L. Smith, D. M. Sloane, L. H. Aiken, and W. Sermeus. 2015. "Organization of Hospital Nursing, Provision of Nursing Care, and Patient Experiences With Care in Europe." *Med Care Res Rev.*
  - Kalisch, B. J., B. Xie, and B. W. Dabney. 2014. "Patient-Reported Missed Nursing Care Correlated With Adverse Events." *American Journal of Medical Quality 29(5): 415-22.*
  - Kalisch, B. J., D. Tschannen, and K. H. Lee. 2012. "Missed Nursing Care, Staffing, and Patient Falls." *Journal of Nursing Care Quality 27(1): 6-12.*

Patients are entitled to nurse staffing that assures safe and reliable care

- To sum up to this point
  - Nurses work is complex, cognitively and managerially demanding
  - The evidence is substantial that when RN staffing is low, length of stay and adverse events are higher than they need to be
    - Longer lengths of stay are measures of both quality and efficiency, the ability of nurses to get their care done.
    - This relationship is causal
      - Policy and management should reflect this
- Patients are entitled to staffing that assures safe and reliable care
  - Competition and public reporting (Consumer Reports model) not sufficient
    - Patients don't always have choice of hospital
    - Nursing is core service of hospital
  - Patients should be able to expect the hospital can deliver care safely and reliably (Underwriters Laboratory model)

Higher, safer staffing is affordable

- When assessing costs of improved nurse staffing, need to consider not only the cost of higher staffing but cost offsets:
  - Shorter stays, reduced adverse events, reduced readmissions and better work environment that reduces turnover
- Four studies that address these questions find:
  - Higher RN mix of RN and LPNs cost saving
  - Higher nursing hours add less than 1.5% to hospital costs and may add no costs:
    - Microsimulation studies show small net cost
      - Needleman 2006, Dall 2009, Shamliyan Kane 2009
    - Direct regression of per admission cost on staffing levels finds no statistically significant increase in cost/admission in hospitals with higher staffing per patient
      - Rand study (Martsolf 2014 Medical Care)
- Looking only at the increased cost of nursing, ignoring the offsetting cost savings provides a misleading picture of the net cost of safe staffing levels
  - ***Given the offsetting cost savings, safe staffing levels can be achieved with little or no net cost to the hospital***

Avoided Adverse Outcomes, Hospital Days, Costs, And Deaths If Proportion Of Registered Nurses (RNs) Or Number Of Licensed Nursing Hours Were Increased To The 75th Percentile Of Hospitals Studied, National Estimates Updated To 2002

	Option 1: Raise proportion of RNs from 75th percentile without changing number of licensed hours	Option 2: Raise number of licensed hours to 75th percentile without changing proportion of RNs	Option 3: Raise both proportion of RNs and number of licensed hours to 75th percentile
Number of avoided adverse outcomes			
Failure to rescue (major surgery pool)	354	597	942
Urinary tract infection	40,770	4,174	44,773
Hospital-acquired pneumonia	11,761	1,372	13,093
Upper GI bleeding	4,145	4,129	8,182
Shock or cardiac arrest	2,908	540	3,426
Total avoided outcomes	59,938	10,813	70,416
Hospital days avoided	1,507,493	2,598,339	4,106,315
Cost impacts (in millions)			
Cost savings assuming that 40% of hospital costs are variable			
Cost savings of avoided outcomes	$ 73	$ 17	$ 89
Cost savings of avoided days	980	1,702	2,683
Total avoided costs	1,053	1,719	2,772
Net cost of increasing nursing	−242	5,819	5,716
Net cost as percent of hospital expenses	−0.1%	1.5%	1.4%
Cost savings assuming that fixed hospital costs are recovered (in millions)			
Cost savings of avoided outcomes	$ 183	$ 42	$ 224
Cost savings of avoided days	2,450	4,256	6,707
Total avoided costs	2,633	4,298	6,930
Net cost of increasing nursing	−1,821	3,240	1,558
Net cost as percent of hospital expenses	−0.5%	0.8%	0.4%
Avoided deaths	4,997	1,801	6,754

SOURCE: Authors' estimates using data from J. Needleman et al., "Nurse-Staffing Levels and Quality of Care in Hospitals," *New England Journal of Medicine* 346, no. 22 (2002): 1415–1422, updated to 2002 based on 1997 and 2002 American Hospital Association annual survey data and on wage data for nurses employed in hospitals from the Current Population Survey.

NOTES: Urinary tract infection, hospital-acquired pneumonia, upper gastrointestinal (GI) bleeding, and shock or cardiac arrest and change in length-of-stay were analyzed for medical patients only. Failure to rescue was analyzed for surgical patients only. Cost savings of avoided outcomes and days are initially reduced by 60 percent based on research that only 40 percent of hospital costs are variable in the short run. Over time, fixed costs should be reduced to reflect changed volume. Estimates based on recovery of 40 percent of average costs and all average costs are presented. Net cost of increasing nurse staffing was calculated by subtracting total estimated cost savings due to avoided outcomes and days from cost of increasing nurse staffing reported in Exhibit 3.

Avoided Days and Adverse Outcomes Associated with Raising Nurse Staffing to 75th Percentile
Estimates from Needleman/Buerhaus, Health Affairs, 2006

	Raise RN Proportion	Raise Licensed Hours	Do Both
Avoided Days	1,507,493	2,598,339	4,106,315
Avoided Adverse Outcomes Cardiac arrest and shock, pneumonia, upper gastrointestinal bleeding, deep vein thrombosis, urinary tract infection	59,938	10,813	70,416
Avoided Deaths	4,997	1,801	6,754

What are the costs and cost offsets of increased nurse staffing
Estimates from Needleman/Buerhaus, Health Affairs, 2006

	Raise RN Proportion	Raise Licensed Hours	Both
Cost of higher nursing	$ 811 Million	$ 7.5 Billion	$ 8.5 Billion
Avoided costs (full cost)	$ 2.6 Billion	$ 4.3 Billion	$ 6.9 Billion
Long term cost increase	($ 1.8 Billion)	$ 3.2 Billion	$ 1.6 Billion
As % of hospital costs	-0.5%	0.8%	0.4%
Short term cost increase (save 40% of average)	($ 2.4 Billion)	$ 5.8 Billion	$ 5.7 Billion
As % of hospital costs	-0.1%	1.5%	1.4%

Table from Martsolf 2014 showing regression estimates of changes in cost/admission of higher staffing

TABLE 2. Fixed Effect Model Results for Nurse Staffing, Length of Stay, and Total Cost Measures

Nurse Staffing Measures	Models	
	1	2
% with any nursing-sensitive adverse event		
Total no. discharges	11,754,487	11,754,487
Total no. licensed nurses (RN+LPN) per 1000 inpatient days	−0.252* (−0.444, −0.059)	—
All nursing staff (including aides) per 1000 inpatient days	—	−0.191* (−0.364, 0.019)
Percentage of licensed nurses (RN+LPN) that are RNs	0.094 (−0.019, 0.206)	—
Percentage of nursing staff (including aides) that are licensed nurses (RN+LPN)	—	−0.007 (−0.036, 0.021)
Length of stay		
Total no. discharges	18,466,880	18,466,880
Total no. licensed nurses (RN+LPN) per 1000 inpatient days	−0.033* (−0.059, −0.007)	—
All nursing staff (including aides) per 1000 inpatient days	—	−0.031** (−0.051, −0.011)
Percentage of licensed nurses (RN+LPN) that are RNs	−0.009 (−0.021, 0.003)	—
Percentage of nursing staff (including aides) that are licensed nurses (RN+LPN)	—	−0.001 (−0.004, 0.006)
Total cost ($)		
Total no. discharges	16,971,758	16,971,758
Total no. licensed nurses (RN+LPN) per 1000 inpatient days	166.5 (−35.0, 368.1)	—
All nursing staff (including aides) per 1000 inpatient days	—	63.1 (−70.5, 196.7)
Percentage of licensed nurses (RN+LPN) that are RNs	−87.0* (−153.6, −20.4)	—
Percentage of nursing staff (including aides) that are licensed nurses (RN+LPN)	—	41.2 (−25.6, 108.0)

*$0.01 \leq P < 0.05$.
**$0.001 \leq P < 0.01$.
LPN indicates licensed practical nurses; RN, registered nurses.

The right staffing levels vary from unit to unit Hospital-staff developed staffing models are a realistic and feasible approach to assuring appropriate staffing

- Staffing needs vary from hospital to hospital, unit to unit, day to day based on patient acuity, admissions and discharges
- Hospital systems for establishing appropriate staffing vary
  - Data driven acuity systems like QuadraMed Acuity Plus
  - Simple grids based on census
    - Can modify grid formally or informally based on patient characteristics or experience of available nurses
  - See Jan-Feb and Mar-Apr 2015 issues of Nursing Economic$ for papers on designing staffing models
- We know staffing models developed and implemented jointly by management, unit leadership, and front line staff are realistic and feasible because there are examples in place
  - I am currently evaluating one model in a community hospital
  - Other examples

To recap:

1. Nursing is complex, cognitively and managerially challenging work, a fact not appreciated by public or frankly all health care executives
2. Nurse staffing matters: there is extensive evidence that nurse staffing levels influence patient safety and outcomes such as death and hospital acquired complications
3. Patients are entitled to nurse staffing at levels that assure safe and reliable care
4. Higher, safer staffing is affordable
5. The right staffing levels vary from hospital to hospital and unit to unit, and is not one size fits all, so hospital-staff jointly developed staffing models are a realistic and feasible approach to assuring appropriate staffing