



BOSTON COLLEGE

WILLIAM F. CONNELL SCHOOL OF NURSING

Comments of
Judith Shindul-Rothschild, Ph.D., RNPC
Associate Professor
William F. Connell School of Nursing, Boston College
on behalf of the Massachusetts Nurses Association
December 23, 2014
Nurse Staffing Quality Measures

Thank you for this opportunity to present comments to the Health Policy Commission (HPC) on regulations pertaining to nurse staffing quality measures pursuant to Chapter 155 of the Acts of 2014. My name is Dr. Judith Shindul-Rothschild, PhD, RNPC. I am a registered nurse who has practiced for over 35 years in the Commonwealth. I am employed as an associate professor at the William F. Connell School of Nursing at Boston College and I am presenting these comments on behalf of the Massachusetts Nurses Association. I have not been reimbursed or compensated for this analysis and I declare no conflicts of interest. In addition to these written comments I would refer the Health Policy Commission to my testimony presented to the Committee on Quality Improvement and Patient Protection on October 29, 2014.

Executive Summary:

In formulating a recommendation of 5 patient safety quality indicators, I was guided by specific criteria set forth by the HPC that the measures be: (a) nationally validated and evidence-based, (b) related to nursing care in ICUs; (c) applicable to ICUs in a range of Massachusetts hospitals; and (d) publically available. An additional factor I considered was to have balance among the 5 indicators between healthcare acquired conditions (HAC), patient safety indicators (PSI), and Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS). Based upon my analysis of RN staffing in Massachusetts ICUs/CCUs from 2009 to 2013 with the patient safety quality indicators listed by the HPC, I recommend that the HPC consider for inclusion the following measures in rank order: (1) catheter associated urinary tract infection (CAUTI); (2) adult inpatients self-report of pain control; (3) post-operative wound dehiscence; (4) death among surgical inpatients with serious treatable complications; and, (5) patient falls with injury.

Background on Statistical Analysis

In preparing my recommendations, I conducted a longitudinal analysis of registered nurse (RN) to patient ratios in Massachusetts hospitals using publically available data from the Massachusetts Hospital Association from 2009 to 2013. I calculated the average RN to patient ratio in 68 Massachusetts hospitals with Intensive Care Units (ICUs) and Cardiac Care Units (CCUs) from 2009 to 2013. I examined the Pearson one-tailed correlations with the average RN to patient ratio with 2 patient safety indicators (PSI), 4 health care acquired conditions (HAC) from the Agency for Healthcare Research and Quality (AHRQ) and 1 quality measures of patient's experience measured in the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) Survey by the Centers for Medicare and Medicaid Services (CMS). To determine if these safety quality measures were applicable in all ICU settings, separate Pearson one-tailed correlations were conducted between RN staffing and patient outcome measures for the following: (1) geographic location defined as the 3 Dartmouth health referral regions – Boston ($N = 40$), Worcester ($N = 7$) and Springfield ($N = 11$); (2) teaching hospitals ($N = 13$); (3) community hospitals ($N = 54$); (4) disproportionate share hospitals ($N = 22$); (5) non-disproportionate share hospitals ($N = 45$); (6) for profit hospitals ($N = 9$); (7) nonprofit hospitals ($N = 48$); (8) medical-surgical ICUs with 9 or fewer beds ($N = 16$), 10 to 20 beds ($N = 18$), and 21 or more beds ($N = 12$); and (9) CCUs with 9 or fewer beds ($N = 10$), 10 to 20 beds ($N = 5$), and 21 or more beds ($N = 5$). Table 1 summarizes these findings. A reference list provides additional information on the technical specifications on each of these indicators from AHRQ and CMS as well as additional documentation to support the evidence based validation from National Quality Forum (NQF) and the National Quality Measure Clearinghouse.

Are There Additional Safety Quality Measures the HPC Should Consider?

1. An additional safety quality measures that the HPC should consider is **Poor Glycemic Control**

- a. YES.** Glycemic control is evidence-based and nationally validated by the Centers for Medicare and Medicaid Services (CMS). Poor glycemic control is one of 11 categories of HACs defined by CMS by final rule in 2009 and is listed in the final rule for HAC through FY 2015. Manifestations of poor glycemic control include: Diabetic Ketoacidosis, Nonketotic Hyperosmolar Coma, Hypoglycemic Coma, Secondary Diabetes with Ketoacidosis and Secondary Diabetes with Hyperosmolarity. The CMS rationale states: *“Extreme manifestations of poor glycemic control are reasonably prevented through careful nursing surveillance, application of evidence based guidelines and routine serum glucose measurement.”* CMS notes that no changes have been made to the list of HACs for the last 3

years. See CMS website for list of HAC for 2014 to 2015 which includes poor glycemic control at:

http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/HospitalAcqCond/Hospital-Acquired_Conditions.html).

- b. **YES.** My research found that there is a curvilinear pattern between poor glycemic control and RN staffing in Massachusetts ICUs/CCUs, however the rate is lowest for ICU/CCUs where ICU RNs care for the fewest number of patients. See Shindul-Rothschild testimony submitted to the Committee on Quality Improvement and Patient Protection on October 28, 2014 for detailed analysis.
- c. **NO.** My analysis found no significant association between poor glycemic control and RN staffing in ICUs/CCUs by region, teaching or community hospital, disproportionate share or non-disproportionate share hospital; for-profit or non-profit hospital, or by bed size in either medical-surgical ICUs or CCUs.
- d. **YES.** Reporting of HAC is mandated by CMS for all claims involving inpatient admissions to general acute care hospitals or other facilities. See CMS website on reporting at: <http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/HospitalAcqCond/Reporting.html>
- e. The NQF (2009) recommends nurse sensitive indicators be collected monthly and reported quarterly. HPC should evaluate the validity of poor glycemic control as a relevant quality measure through analysis of associations between RN staffing and glycemic control on all Massachusetts hospital units.

Measures Considered for Inclusion by the HPC in Regulations

1. Registered nurse hours per patient day (RN HPPD).

- a. **YES.** Nursing Hours per Patient Day as a patient safety measure nationally validated by the National Quality Forum (NQF).
- b. **YES.** The NQF notes that RN HPPD is a structural factor that has been significantly associated with better patient outcomes. ***It should be noted that RN HPPD is not a patient outcome measure and therefore it is my recommendation that RN HPPD not be included as one of the 5 safety quality measures.*** There are limitations associated with the reliability of RN HPPD related to the denominator. The steward of the measure, the American Nurses Association, states only direct care RNs are to be included in the numerator. Some health services researchers have noted that self-reports of RN staffing by staff nurses is a more reliable measure of actual nurse staffing than hospital reports. Self-reports by RNs give the actual number of RNs

working at the bedside, not RNs scheduled or RNs having additional indirect care responsibilities. I have used RN HPPD computed from the American Hospital Association Annual Survey of Hospitals in my own research and I acknowledge these limitations (Shindul-Rothschild & Gregas, 2014; Stamp, Flanagan, Gregas & Shindul-Rothschild, 2014).

- c. **YES.** The Agency for Healthcare Research and Quality (AHRQ) conducted a meta-analysis and found a strong and consistent relationship between nurse staffing and patient outcomes in intensive care units. Research has found RN HPPD is associated with hospital acquired infections, falls, pressure ulcers and deaths among surgical inpatients with serious treatable complications.
- d. **NO.** RN HPPD is not currently publically reported by Massachusetts hospitals. RN full time equivalents, full time RNs and part-time RNs are reported in the American Hospital Association (AHA) Annual Survey of Hospitals which is propriety and not publically available. The Massachusetts Hospital Association voluntarily reports the number of RNs, scheduled for days, evenings and nights, 7 days a week for every hospital unit as well as the average patient census on the unit on the Patient's First website. The Patient's First RN staffing information is publically available. I have used both the Patient's First RN staffing data and the AHA RN HPPD data in my research with explicit language in publications acknowledging the limitations pertaining to reliability and validity these measures because of missing data and the potential for inflating the actual RN staffing. In my opinion, the Patient's First RN staffing data is a more relevant measure because it is unit based, not aggregated across the hospitals as is the RN full time equivalent data in the AHA Annual Survey of Hospitals.
- e. NQF (2009) recommends nursing skill mix should be collected monthly and reported quarterly at the unit level. The Massachusetts Hospital Association Patient' First website voluntarily reports RN staffing annually. There is missing data especially on stepdown units in specific hospitals. Because of the problems with missing data in the Patient's First website, in my research I have calculated the average number of RNs to patients over a 5 year period. Given the known limitations regarding the reliability and validity of American Hospital Association Annual Survey of RN full-time equivalents used to calculate RN HPPD and the missing data on the Massachusetts Hospital Association Patient's First website, it is my strong opinion, that both measures should be validated with self-reports by staff nurses about the actual number of RNs providing direct patient care on a specific hospital unit, by shift and day of the week on a quarterly basis.

2. Central venous catheter-related blood stream infections (CLABSI) score

- a. **YES.** CLABSI score is Patient Safety Indicator included in the Hospital Inpatient Quality Reporting program and nationally validated by Agency for Healthcare Research and Quality (AHRQ). See: AHRQ quality indicators (March, 2012). *Patient safety indicators: technical specifications* [version 4.4]. Rockville (MD): Agency for Healthcare Research and Quality. 79 p.
- b. **YES.** CLABSI measures how often hospitalized patients with intravenous (IV) lines and catheters acquired blood infections as a result of the care they received in the hospital. Studies have shown that most of these infections related to large venous catheters can be prevented by inserting the catheter properly and careful nursing management. (See NQMC – 8086). In my analysis I did not find a significant correlation of RN staffing in ICUs/CCUs with CLABSI score for all Massachusetts hospitals. (See Table 1).
- c. **YES.** My analysis found significant correlations of the CLABSI score with RNs staffing in Springfield region ICUs/CCUs ($r = -0.942, p = .008$), in medical-surgical ICUs with 10 to 20 beds ($r = -.464, p = .047$) and in CCUs with 21 or more beds ($r = -0.893, p = .021$). ***Given the limited applicability of CLABSI in Massachusetts ICUs/CCUs, I recommend the HPC rank CLABSI 6th for inclusion as a patient safety quality measure.*** (See Table 1 and Shindul-Rothschild testimony to the Committee on Quality Improvement and Patient Protection on October 28, 2014).
- d. **YES.** CLABSI is publically reported by CMS on the Hospital Compare website. The safety quality measures chosen should be reported on a single site with RN staffing data for Massachusetts hospitals.
- e. NQF (2009) recommends CLABSI should be collected monthly and reported quarterly at the unit level.

3. Catheter associated urinary tract infection score

- a. **YES.** CAUTI score is a Hospital Acquired Condition (HAC) indicator included in the Hospital Inpatient Quality Reporting program and nationally validated through the Centers for Disease Control and Prevention (CDC).
- b. **YES.** CMS (2014, p. 22) states CAUTI can be minimized by prevention strategies that include careful nursing surveillance by “removing indwelling catheters at the earliest possible time, securing catheters to the patient’s leg to avoid bladder and urethral trauma, keeping the urine collection bag below the level of the bladder and utilizing aseptic technique for urinary

catheter insertion”. My analysis found significant correlations of CAUTI score with RN staffing in all Massachusetts ICUs/CCUs ($r = -0.306, p = .010$).

- c. **YES.** My analysis indicates that there is a significant association between the CAUTI score and RN staffing in Boston region ICUs/CCUs, ($r = -0.562, p < .001$), Worcester region ICUs/CCUs ($r = -0.766, p = .038$), teaching hospital ICUs/CCUs ($r = -0.633, p = .014$), community hospital ICUs/CCUs ($r = -.283, p = .031$), non-disproportionate share ICUs/CCUs ($r = -0.451, p = .002$), for-profit ICUs/CCUs ($r = -.862, p = .001$), nonprofit ICUs/CCUs ($r = -.386, p = .008$), medical-surgical ICUs with 21 or more beds ($r = -0.590, p = .022$), CCUs with 10 to 20 beds ($r = 0.928, p = .011$), and CCUs with 21 or more beds ($r = -0.810, p = .048$) (see Table 1). ***Given the wide applicability of CAUTI across a diverse range of ICUs/CCUs in Massachusetts hospitals, I strongly recommend the HPC rank CAUTI #1 for inclusion as a patient safety quality measure.***
- d. **YES.** The CAUTI score is publically reported by CMS on the Hospital Compare website. The safety quality measures chosen should be reported on a single site with RN staffing data for Massachusetts hospitals.
- e. NQF (2009) recommends CAUTI should be collected monthly and reported quarterly at the unit level.

4. Falls without injury

- a. **Yes.** Patient falls is a nurse sensitive measure nationally validated by the National Quality Forum (NQF). Falls without injury is not a HAC publically reported by inpatient hospitals.
- b. **Yes.** The measure as defined by the NQF includes all patient falls with and without injury.
- c. **No.** Not publically available for inpatient hospitals and therefore I could not conduct an analysis of applicability across a range of Massachusetts ICUs/CCUs.
- d. **No.** Not publically available. ***Given absence of publically available data in Massachusetts ICUs/CCUs on falls without injury my recommendation is that the HPC not consider including falls without injury as one of 5 patient safety quality measures for Massachusetts ICUs/CCUs.***
- e. NQF (2009) recommends patient falls should be collected monthly and reported quarterly at the unit level.

5. Falls with injury per 1,000 patient days

- a. **YES.** Falls with injury is a Hospital Acquired Condition (HAC) indicator included in the Hospital Inpatient Quality Reporting program and nationally validated by Centers for Medicare and Medicaid Services. See: Centers for Medicare & Medicaid Services (October, 2012).*Hospital-Acquired Conditions (HAC) in Acute Inpatient Prospective Payment System (IPPS) Hospitals.* Washington, DC: Department of Health and Human Services. Retrieved on August 25, 2014 from:
<http://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/HospitalAcqCond/downloads/HACFactSheet.pdf>.
- b. **YES.** Falls are the most common adverse event reported in hospitals. CMS (2014) regulations limit hospital reimbursement for care related to fall with injury. Preventable hospital injuries are related to nursing surveillance to assess and intervene to minimize the patient's fall risk. Many falls occur when a patient is attempting to access the bathroom or has a syncope episode related to multiple hypotensive or anticholinergic medication. This measure includes fracture, dislocation, intracranial injury, crushing injury, burn and other injuries that occur while a patient is hospitalized. My analysis indicates there is evidence of a linear pattern with higher falls with injury occurring when RNs care for greater numbers of patients in ICU/CCUs (see Shindul-Rothschild testimony to the Committee on Quality Improvement and Patient Protection on October 28, 2014).
- c. **YES.** Significantly higher numbers of falls with injury are associated with RN staffing in Springfield region ICUs/CCUs ($r = 0.720, p = .009$), teaching hospital ICUs/CCUs ($r = -0.542, p = .034$), disproportionate share ICUs/CCUs ($r = 0.446, p = .021$) and medical-surgical ICUs with 9 or fewer beds ($r = 0.533, p = .030$) (see Table 1.). ***Given the demonstrated applicability of falls with injury across a range of ICUs/CCUs in Massachusetts hospitals, I recommend the HPC rank falls with injury #5 for inclusion as a patient safety quality measure.***
- d. **YES.** Falls with injury is publically reported by CMS on the Hospital Compare website. The safety quality measures chosen should be reported on a single site with RN staffing data for Massachusetts hospitals. Falls without injury is not publically reported to CMS and therefore I do not recommend it's inclusion in the 5 patient safety quality measures.
- e. NQF (2009) recommends falls with injury should be collected monthly and reported quarterly at the unit level.

6. Pressure ulcer hospital acquired: rate per 1,000 discharges.

- a. **YES.** Pressure ulcer hospital acquired is Patient Safety Indicator (PSI) included in the Hospital Inpatient Quality Reporting Program and is nationally validated by the Agency for Healthcare Research and Quality (AHRQ) Quality Indicators. See: AHRQ QI (March, 2012). Patient safety indicators #3: technical specifications. Pressure ulcer rate [version 4.4]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 3 p.
- b. **NO.** This indicator measures how often patients developed a pressure ulcer during a hospital stay of more than four days. The National Quality Measure Clearinghouse notes that pressure ulcers can occur because people are lying in one position for too long and can often be prevented with nursing proper care. (See NQMC-8083). My analysis indicates there not a linear relationship, nor is there a statistically significant correlation of higher pressure ulcers with RN staffing in Massachusetts ICUs/CCUs (see Shindul-Rothschild testimony to the Committee on Quality Improvement and Patient Protection on October 28, 2014).
- c. **NO.** My analysis indicates there is no evidence of a significant correlation of higher pressure ulcers with RN staffing in a range of Massachusetts ICU/CCU settings (see Table 1). *Given absence of applicability in Massachusetts ICUs/CCUs, my recommendation is that the HPC not consider including hospital acquired pressure ulcers as one of 5 patient safety quality measures for Massachusetts ICUs/CCUs.*
- d. **YES.** Pressure ulcer hospital acquired is publically reported by CMS on the Hospital Compare website. The safety quality measures chosen should be reported on a single site with RN staffing data for Massachusetts hospitals.
- e. NQF (2009) recommends pressure ulcer hospital acquired should be collected quarterly and reported quarterly at the unit level.

7. Restraint Prevalence (vest and limb)

- a. **YES.** Restraint prevalence (vest and limb) is a nurse sensitive measure nationally validated by the National Quality Forum (NQF).
- b. **YES.** The NQF (2009) defines type of restraint as limb (including soft or leather), vest or other and has included restraint prevalence in the nursing-sensitive care measure set. CMS has noted restraints with injury is under consideration for possible

inclusion in HAC injury (see <http://www.cms.gov/Newsroom/MediaReleaseDatabase/Fact-Sheets/2011-Fact-Sheets-Items/2011-08-013.html>)

- c. **NO.** Restraint prevalence for inpatient hospitals is not publically available. Therefore I could not conduct an analysis of whether this measure is applicable in Massachusetts ICUs/CCUs.
- d. **NO.** CMS provides publically available data on restraint prevalence in psychiatric hospitals and long term care facilities, but not on inpatient hospitals with ICUs/CCUs. *Given absence of publically available data in Massachusetts ICUs/CCUs on restraint prevalence, my recommendation is that the HPC not consider including restraint prevalence as one of 5 patient safety quality measures for Massachusetts ICUs/CCUs.*
- e. NQF (2009) recommends restraint prevalence should be collected quarterly and reported quarterly at the unit level. The measure should be publically reported by Massachusetts inpatient hospitals.

8. Adult inpatients who reported how often their pain was controlled

- a. **YES.** This measure is a Clinical Quality Measures on Patient Experience nationally validated by the Centers for Medicare & Medicaid Services (CMS). <https://www.cms.gov/Medicare/Quality-Initiatives-Patient-Assessment-Instruments/HospitalQualityInits/HospitalRHQDAPU.html>

See: Centers for Medicare & Medicaid Services (CMS) (2013). *HCAHPS survey*. Baltimore (MD): Centers for Medicare & Medicaid Services (CMS);18 p. The Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) Survey is part of a larger Consumer Assessment of Healthcare Providers and Systems (CAHPS) program sponsored by the Agency for Healthcare Research and Quality (AHRQ). The purpose of HCAHPS is to produce comparable data on patients' perspectives of care that allows objective comparisons between hospitals and create incentives for hospitals to improve their quality of care. This specific measure is used to assess the percentage of adult inpatients who reported how often ("Never," "Sometimes," "Usually," "Always") their pain was controlled by asking patients: "During this hospital stay, how often was your pain well controlled?"

- b. **YES.** My analysis indicates that patient's perception of pain control is a robust indicator associated with RN staffing on ICU/CCUs in Massachusetts hospitals from 2009 to 2013. Higher percentages of patient's self-reporting their pain was "always" well controlled is significantly associated with fewer numbers of patients assigned to RNs in Massachusetts

ICUs/CCUs ($r = -0.337, p = .003$) (See Table 1 and Figures 1-4 in Shindul-Rothschild testimony to the Committee on Quality Improvement and Patient Protection on October 28, 2014).

- c. **YES.** My analysis found significant associations between patient's self-reporting their pain was "always" well controlled and RNs staffing in the Springfield region ICUs/CCUs ($r = -0.584, p = .030$), community hospital ICUs/CCUs ($r = -0.387, p = .002$), non-disproportionate share hospitals ($r = -0.395, p = .004$), non-profit hospital ICUs/CCUs ($r = -0.319, p = .014$), medical-surgical ICUs with 9 or fewer beds ($r = -0.540, p = .015$), medical-surgical ICUs with 10 to 20 beds ($r = .534, p = .011$), CCUs with 10-20 beds ($r = .948, p = .007$), and CCUs with 21 or more beds ($r = -.966, p = .004$)(see Table 1.). ***Given the wide applicability of patient's self-report of pain control across a range of ICUs/CCUs in Massachusetts hospitals, I recommend the HPC rank adult inpatients who reported how often their pain was controlled as #2 for inclusion as a patient safety quality measure.***
- d. **YES.** HCAHPS is publically reported by CMS on the Hospital Compare website. The safety quality measures chosen should be reported on a single site with RN staffing data for Massachusetts hospitals.
- e. The HCAHPS is collected by CMS quarterly and reported annually on the Hospital Compare website.

9. Postoperative wound dehiscence

- a. **YES.** Postoperative wound dehiscence is a Patient Safety Indicator (PSI) included in the Hospital Inpatient Quality Reporting Program and nationally validated by Agency for Healthcare Research and Quality (AHRQ) Quality Indicators. See: AHRQ quality indicators (March, 2012). Patient safety indicators: technical specifications [version 4.4]. Appendices. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ).
- b. **YES.** National Quality Measure Clearinghouse states that studies show that proper surgical and nursing care can prevent wound dehiscence from occurring in many cases. (NQMC-8101). My research indicates that postoperative wound dehiscence is associated with RN staffing on ICU/CCUs in Massachusetts hospitals from 2009 to 2013. There is a non-significant, curvilinear pattern of association in ICU/CCUs, however the rate is lowest for units where ICU RNs care for the fewest number of patients. (see Appendix pgs. 7- 10 in Shindul-Rothschild testimony to the Committee on Quality Improvement and Patient Protection on October 28, 2014).

- c. **YES.** My analysis found significant associations between postoperative wound dehiscence and RNs staffing in Boston region ICUs/CCUs ($r = .357, p = .013$), Springfield region ICUs/CCUs ($r = -.746, p = .010$), disproportionate share ICUs/CCUs ($r = 0.397, p = .046$), CCUs with 9 or fewer beds ($r = 0.642, p = .031$), and CCUs with 10-20 beds ($r = .943, p = .008$) (see Table 1.). ***Given the demonstrated applicability of postoperative wound dehiscence across a range of ICUs/CCUs in Massachusetts hospitals, I recommend the HPC rank postoperative wound dehiscence as #3 for inclusion as a patient safety quality measure.***
- d. **YES.** Postoperative wound dehiscence is publically reported by CMS on the Hospital Compare website. The safety quality measures chosen should be reported on a single site with RN staffing data for Massachusetts hospitals.
- e. Postoperative wound dehiscence should be collected quarterly and reported quarterly at the unit level.

10. Death among surgical inpatients with serious treatable complications: deaths per 1,000 discharges.

- a. **YES.** Death among surgical inpatients with serious treatable complications: deaths per 1,000 discharges is a Patient Safety Indicator (PSI) included in the Hospital Inpatient Quality Reporting Program that is nationally validated by the Agency for Healthcare Research and Quality (AHRQ) Quality Indicators. See: AHRQ quality indicators (March, 2012). *Patient safety indicators: technical specifications* [version 4.4]. Rockville (MD): Agency for Healthcare Research and Quality (AHRQ); 79 p.
- b. **YES.** This indicator measures how often patients died after developing a complication that should have been identified quickly and treated (also called failure to rescue). The underlying assumption is that high quality hospitals identify these complications quickly and treat them aggressively. Serious treatable complications of care listed in death among surgical inpatients include: pneumonia, deep vein thrombosis/pulmonary embolism, sepsis, shock/cardiac arrest, or gastrointestinal hemorrhage/acute ulcer. Characteristics associated with better outcomes include: bed-to-nurse ratio (where nurses are the sum of registered nurse plus licensed practical nurse full-time equivalent positions); and nursing skill mix (the ratio of RN/[RN+LPN]) (Silber et al., 2007; Aiken et al., 2002; Aiken et al., 2003). (NQMC-8084 and NQMC-9283). My research indicates that preventable deaths is significantly associated with RN staffing in all Massachusetts ICUs/CCUs ($r = 0.307, p = .017$) (Table 1 and See Figures 19 – Figure 23 in Shindul-Rothschild testimony to the Committee on Quality Improvement and Patient Protection on October 28, 2014). The patient safety indicator composite score of serious complications is also significantly associated with RN staffing in

ICUs/CCUs ($r = -0.336, p = .004$). The safety indicator composite score includes iatrogenic pneumothorax, PE/DVT, dehiscence, accidental punctures/lacerations, pressure ulcer, CLABSI, hip fracture and sepsis.

- c. **YES.** My analysis found significant associations between deaths among surgical inpatients with serious treatable complications and RNs staffing in Worcester region ICUs/CCUs ($r = -0.999, p = .013$), Springfield region ICUs/CCUs ($r = 0.829, p = .041$) and CCUs with 21 or more beds ($r = 0.874, p = .026$) (see Table 1.). ***Given the demonstrated applicability of deaths among surgical inpatients with serious treatable complications across a range of ICUs/CCUs in Massachusetts hospitals, I recommend the HPC rank deaths among surgical inpatients with serious treatable complications #4 for inclusion as a patient safety quality measure.***
- d. **YES.** Deaths among surgical inpatients with serious treatable complications is publically reported by CMS on the Hospital Compare website. The safety quality measures chosen should be reported on a single site with RN staffing data for Massachusetts hospitals.
- e. Deaths among surgical inpatients with serious treatable complications should be collected quarterly and reported quarterly at the unit level

In Summary

The five patient safety quality outcome measures I recommend to the Health Policy Commission in rank order are: (1) catheter-associated urinary tract infection (a Healthcare Acquired Condition reported by CMS); (2) pain control (as reported by adult inpatients in HCAHPS); (3) postoperative wound dehiscence (a Patient Safety Indicator reported by AHRQ); (4) death among surgical inpatients with serious treatable complications (a Patient Safety Indicator reported by AHRQ;) and, (5) inpatient falls with injury (a Healthcare Acquired Condition reported by CMS) . Thank you for this opportunity to present my written comments as you promulgate regulations pertaining to registered nurse staffing in Massachusetts ICUs. If I can be of any further assistance to you or the Executive Director and staff of the Health Policy Commission, my contact information is listed at the end of this testimony.

Table 1. RN ICU/CCU staffing with Patient Outcome Measures by Setting, Hospital Type and Geographic Location, 2009-2013

Massachusetts Hospital ICU/CCU Settings	N	HCAHPS		Hospital Acquired Conditions			Patient Safety Indicators		Sum by Setting
		Pain	CAUTI	Falls with Injury	CLABSI	Pressure Ulcer	Dehiscence Post-Surgery	Deaths Post-Surgery Treatable Complications	
Massachusetts ICUs/ CCUs	68	++	++					+	5
Boston Region ICUs/CCUs	40		+++				+		4
Worcester Region ICUs/CCUs	7		+					+	2
Springfield Region ICUs/CCUs	11	+		++	++		++	++	9
Teaching Hospitals ICUs/CCUs	13		+	+					2
Community Hospitals ICUs/CCUs	54	++	+						3
Disproportionate Share ICUs/CCUs	22			+			+		2
Non-Disproportionate Share ICUs/CCUs	45	++	++						4
For-Profit ICU/CCUs	9		+++						3
Non-Profit ICU/CCUs	48	+	++						3
Medical- Surgical ICUs <=9 Beds	16	+		+					2
Medical-Surgical ICUs 10-20 Beds	18	+			+				2
Medical-Surgical ICUs >=21 Beds	12		+						1
Cardiac Care Units <=9 Beds	10						+		1
Cardiac Care Units 10-20 Beds	5	++	+				++		5
Cardiac Care Units >=21 Beds	5	++	+		+			+	5
Sum of Significant Associations of RN Staffing with Patient Outcomes		14	18	5	4	0	7	5	
RANK OF PATIENT OUTCOMES		#2	#1	#5	#6		#3	#4	

Legend: + ($p < .05$), ++ ($p < .01$), +++ ($p < .001$)

Further Information on Nurse-Sensitive Outcomes Measures Referenced in this Testimony

AHRQ – Patient Safety Indicator Technical specifications

http://www.qualityindicators.ahrq.gov/Modules/PSI_TechSpec.aspx

Centers for Medicare and Medicaid Services, Hospital Compare Data: <https://data.medicare.gov/data/hospital-compare>

Massachusetts Hospital Association, Patient Care link: <http://www.patientcarelink.org/>

National Quality Forum (2009). *Implementation Guide for the NQF Endorsed Nursing-Sensitive Care Measure Set*. Oakbrook, Illinois: The Joint Commission.

National Quality Measure Clearinghouse: <http://www.qualitymeasures.ahrq.gov/browse/nqf-endorsed.aspx>

Shindul-Rothschild, J. & Gregas, M. (2014). Patient Turnover and Nurse Employment in Massachusetts Hospitals Before and After Health Insurance Reform: Implications for the Affordable Care Act. *Policy, Politics & Nursing Practice*, 14 (3-4), 151-162.

Stamp, K. D., Flanagan, J. M., Gregas, M. & Shindul-Rothschild, J. (2014). Predictors of Excess Heart Failure Readmissions: Implications for Nursing Practice. *Journal of Nursing Care Quality*, 29(2), 115-123.

Author Contact Information:

Judith Shindul-Rothschild, PhD, RNPC

Associate Professor

William F. Connell School of Nursing

Boston College

140 Commonwealth Ave.

Chestnut Hill, MA. 02167

Email: judith.shindul-rothschild@bc.edu

Office: (617) 552-4270

Acknowledgments:

The following Boston College Undergraduate Research Assistants contributed to preparing the data used in this analysis: Rachel Rudder (CSON Class of 2014), Tina Bui (CSON Class of 2016) and Brielle Jones (CSON Class of 2016)