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Comments of
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on behalf of the Massachusetts Nurses Association
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Nurse Staffing Quality Measures

Thank you for this opportunity to present comments to the Health Policy Commission 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 and on December 23, 2014.

Executive Summary:

It is essential that the proposed quality indicators have ***sensitivity*** to the population being measured – the quality of nursing care in Massachusetts intensive care units (ICUs). Sensitivity is the capacity of the quality indicator to detect a relationship between nurse staffing in Massachusetts ICUs and the outcome measure. I support the inclusion of two out of the proposed 4 quality measures proposed by the Health Policy Commission -- central line associated blood stream infection score and catheter-associated urinary tract score. My analysis found that both of these hospital acquired conditions (HAC) are significantly associated with RN staffing in Massachusetts ICUs. I do not endorse pressure ulcer prevalence rate (hospital acquired) because my analysis concluded this measure is not a sensitive indicator in Massachusetts ICUs. A 2014 report to CMS entitled, *Evidence-Based Guidelines for Selected, Candidate and Previously Considered Hospital Acquired Conditions* validates

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the inclusion of injuries from falls and trauma as a HAC (Jarrett, Holt & LaBresh 2014). My analysis found patient falls with injury was sensitive to RN staffing in Massachusetts ICUs. I support inclusion of patient falls with injury as a quality measure. I do not support the inclusion of patient fall rate with and without injury as proposed by the Health Policy Commission. (see Table 1 and Shindul-Rothschild testimony to the Committee on Quality Improvement and Patient Protection on October 28, 2014 and December 23, 2014).

The four quality measures proposed by the Health Policy Commission are all indicators of healthcare acquired conditions (HAC). I strongly recommend that the Health Policy Commission eliminate pressure ulcers as quality measure and select two additional indicators to capture the scope and quality of nursing care in Massachusetts ICUs. Pursuant to Chapter 155 of the Acts of 2014 directing the Health Policy Commission to propose 3 to 5 quality measures, it is my recommendation that the regulations include a patient safety indicator (PSI) from Agency for Healthcare Research and Quality (AHRQ) and a nurse-sensitive measure from the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS). Specifically, I recommend the Health Policy Commission include: (1) death among surgical inpatients with serious treatable complications: deaths per 1,000 discharges (PSI); and (2) adult inpatients who reported how often their pain was controlled (HCAHPS). Both of these measures are significantly associated with RN staffing and quality of care in Massachusetts ICUs. (see Table 1 and Shindul-Rothschild testimony to the Committee on Quality Improvement and Patient Protection on October 28, 2014 and December 23, 2014).

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) from AHRQ, 4 health care acquired conditions (HAC) from the Centers for Medicare and Medicaid Services (CMS)and 1 quality measures of patient's experience measured in the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) Survey by 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, Worcester, and Springfield (2) teaching hospitals; (3) community hospitals; (4) disproportionate share hospitals; (5) non-disproportionate share hospitals; (6) for profit hospitals; (7) nonprofit hospitals (8) medical-surgical ICUs with 9 or fewer beds 10 to 20 beds and 21 or more beds and (9) CCUs with 9 or fewer beds, 10 to 20 beds, and 21 or more beds. Table 1 summarizes these findings.

Measures Considered for Inclusion by the Health Policy Commission in Regulations

1. **Catheter associated urinary tract infection score**

   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). My analysis found significant correlations of CAUTI score with RN staffing in all Massachusetts ICUs/CCUs (r = -0.306, p = .010). 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 and Shindul-Rothschild testimony to the Committee on Quality Improvement and Patient Protection on October 28, 2014 and December 23, 2014).

   - ***Given the wide applicability and sensitivity of CAUTI score across a diverse range of ICUs/CCUs in Massachusetts hospitals, I <u>support</u> the inclusion of the CAUTI score as 1 of 5 patient quality measures.***

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

   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). In my analysis I did not find a significant correlation of RN staffing in ICUs/CCUs with CLABSI score for all Massachusetts hospitals. 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). (see Table 1 and Shindul-Rothschild testimony to the Committee on Quality Improvement and Patient Protection on October 28, 2014 and December 23, 2014).

   - ***Given the limited applicability of CLABSI score in Massachusetts ICUs/CCUs, I <u>support</u> the inclusion of the CLABSI score as 1 of 5 patient quality measures with reservations.***

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

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. The CDC does not have guidelines for pressure ulcers Stages III and IV. None of guidelines cited by CMS from non-governmental agencies are specific to stage II and IV pressure ulcer (Jarrett, Holt & LaBresh 2014, p. 14-17). My analysis indicates there not a linear relationship, nor is there a statistically significant correlation of higher pressure ulcers with RN staffing in in a range of Massachusetts ICUs/CCUs. (see Table 1 and Shindul-Rothschild testimony to the Committee on Quality Improvement and Patient Protection on October 28, 2014 and December 23, 2014).

- ***Given absence of applicability in Massachusetts ICUs/CCUs, my recommendation is that the HPC <u>not consider</u> including hospital acquired pressure ulcers as 1 of 5 patient quality measures for Massachusetts ICUs/CCUs.***

4. **Patient Fall Rate**

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. The measure as defined by the NQF includes all patient falls with and without injury. CMS does not include falls without injury as a HAC based upon an analysis of empirical evidence (Jarrett, Holt & LaBresh 2014). Falls with injury is a HAC indicator included in the Hospital Inpatient Quality Reporting program and nationally validated by Centers for Medicare and Medicaid Services. 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. 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 and Shindul-Rothschild testimony to the Committee on Quality Improvement and Patient Protection on October 28, 2014 and December 23, 2014).

- ***My recommendation is that the HPC <u>not</u> <u>consider</u> including patient fall rate with and without injury as 1 of 5 patient quality measures for Massachusetts ICUs/CCUs***.
- ***Given the applicability and sensitivity in Massachusetts ICUs/CCUs, I <u>do</u> recommend the HPC include falls with injury as 1 of 5 patient quality measures.***

Are There Additional Safety Quality Measures the Health Policy Commission Should Consider?

5. **Adult inpatients who reported how often their pain was controlled**

   This measure is a Clinical Quality Measures on Patient Experience nationally validated by the Centers for Medicare & Medicaid Services (CMS). 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). 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 and Shindul-Rothschild testimony to the Committee on Quality Improvement and Patient Protection on October 28, 2014 and December 23, 2014).

   - ***Given the wide applicability and sensitivity of patients' self-report of pain control across a range of ICUs/CCUs in Massachusetts hospitals, I <u>strongly recommend</u> the HPC include adult inpatients who reported how often their pain was controlled as 1 of 5 patient quality measures.***

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

   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. 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. 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 and Shindul-Rothschild testimony to the Committee on Quality Improvement and Patient Protection on October 28, 2014 and December 23, 2014).

- ***Given the demonstrated applicability and sensitivity of deaths among surgical inpatients with serious treatable complications across a range of ICUs/CCUs in Massachusetts hospitals, I <u>strongly recommend</u> the HPC include surgical inpatients with serious treatable complications as 1 of 5 patient quality measures.***

In Summary

The **5** patient quality outcome measures I recommend on behalf of the Massachusetts Nurses Association are: **(1)** catheter-associated urinary tract infection score (a Healthcare Acquired Condition reported by CMS); **(2)** central venous catheter-related blood stream infections score (a Healthcare Acquired Condition reported by CMS); **(3)** inpatient falls with injury rate (a Healthcare Acquired Condition reported by CMS); **(4)** pain control (a nurse-sensitive quality indicator reported by adult inpatients in HCAHPS) and, **(5)** death among surgical inpatients with serious treatable complications (a Patient Safety Indicator reported by AHRQ).

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		**PROPOSED BY HEALTH POLICY COMISSION**					**PROPOSED BY MNA**		**Sum by Setting**
		Hospital Acquired Conditions					**HCAHPS**	**Patient Safety Indicator**	
	N	**CAUTI Score**	**CLABSI Score**	**Falls with Injury**	**Falls without Injury**	**Pressure Ulcer**	**Pain Control**	**Deaths Post-Surgery Treatable Complications**	
Massachusetts ICUs/ CCUs	68	++					++	+	**5**
Boston Region ICUs/CCUs	40	+++							**3**
Worcester Region ICUs/CCUs	7	+						+	**2**
Springfield Region ICUs/CCUs	11		++	++			+	++	**6**
Teaching Hospitals ICUs/CCUs	13	+		+					**2**
Community Hospitals ICUs/CCUs	54	+					++		**3**
Disproportionate Share ICUs/CCUs	22			+					**1**
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								
Cardiac Care Units 10-20 Beds	5	+					++		**3**
Cardiac Care Units >=21 Beds	5	+	+				++	+	**5**
Sum of Significant Associations of RN Staffing with Patient Outcomes		**18**	**4**	**5**	Not Publically Available	**0**	14	**5**	
SUPPORTED BY MNA		**YES**	**YES**	**YES**	***NO***	***NO***	**YES**	**YES**	
5 QUALITY MEASURES		**1**	**2**	**3**			**4**	**5**	

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

Jarrett, N.M., Holt, S. & LaBresh, K.A. (2014). *Evidence-Based Guidelines for Selected, Candidate and Previously Considered Hospital Acquired Conditions: Final Report.* Research Triangle Park: NC. HHSM-500-2012-00142G

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

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