

What's New in the Patient Safety World

February 2019

Nurse Staffing, Workload, Missed Care, Mortality

As we pretty much anticipated (see our October 2018 What's New in the Patient Safety World column "[Nurse Staffing Legislative Efforts](#)"), the recent legislative initiative in Massachusetts to mandate nursing staffing levels failed. We were concerned that the uncertain costs of implementing this legislation would lead to it being voted down and that a potentially useful strategy for improving patient care would be lost. We felt it would have been more politically expedient for Massachusetts to have funded a semi-controlled study in which the state would select a representative sample of different types of hospital (academic, community, rural, etc.) and foot the cost of any upgraded staffing there (CMS and other third party payers could also have contributed to such funding) and then compare patient outcomes against all the other hospitals. But that didn't happen and Massachusetts voted "no" on the proposal.

It's been almost 2 decades since California passed the first law mandating minimum nurse:patient staffing levels. But we continue to debate this topic even today.

You'll recall that a seminal study by Aiken and colleagues found that each additional patient per nurse was associated with a 7% increase in the likelihood of dying within 30 days of admission and a 7% increase in the odds of failure-to-rescue ([Aiken 2002](#)).

Last year the results of a study assessing the impact of a Massachusetts law, which required a 1:1 or 2:1 patient-to-nurse staffing ratio in intensive care units were published ([Law 2018](#)). The researchers compared staffing levels and mortality and certain patient complications between Massachusetts ICU's and out-of-state ICU's. There actually were only modest increases in ICU nurse staffing ratios in Massachusetts (from 1.38 patients per nurse before implementation to 1.28 patients per nurse after) and those staffing increases were largely mirrored in other states that did not have the mandate. Massachusetts ICU nurse staffing regulations were not associated with changes in hospital mortality within Massachusetts or when compared with changes in hospital mortality in other states. Complications and DNR orders also remained on either staffing levels or patient outcomes. We might have predicted that, because ICU's are already staffed at high levels, we would not see much change.

But since then, there has been another study linking poor nursing staffing levels to increased patient mortality. A study in the UK ([Griffiths 2018](#)) looked at in-hospital mortality in relation to nursing staffing, comparing those with staffing levels above to

those below the mean staffing level. They found the hazard of death was increased by 3% for every day a patient experienced RN staffing below the ward mean. Each additional hour of RN care available over the first 5 days of a patient's stay was associated with 3% reduction in the hazard of death. And, days where admissions per RN exceeded 125% of the ward mean were associated with an increased hazard of death (aHR 1.05). Although low nursing assistant staffing was associated with increases in mortality, high nursing assistant staffing was also associated with increased mortality.

We fully support legislation that raises nurse:patient staffing ratios. But the issue is more complex than simple nurse:patient ratios. Those ratios do not take into account actual nurse **workload** nor do they take into account the fatigue factor that may accompany long work shifts or forced overtime. One factor that comes into play in those conditions is the concept of "missed nursing care" or "care left undone" (see our Patient Safety Tips of the Week for November 26, 2013 "[Missed Care: New Opportunities?](#)" and May 9, 2017 "[Missed Nursing Care and Mortality Risk](#)").

We discussed the issue of nursing workload in detail in our Patient Safety Tips of the Week for March 6, 2018 "[Nurse Workload and Mortality](#)" and May 29, 2018 "[More on Nursing Workload and Patient Safety](#)". In those columns we discussed the issue of how to best measure workload.

A prospective study in a level IV NICU in a Midwestern academic medical center evaluated the association between nurse workload and missed nursing care ([Tubbs-Cooley 2018](#)). Workload was assessed each shift with objective measures (infant-to-nurse staffing ratio and infant acuity scores) and a subjective measure (the National Aeronautics and Space Administration Task Load Index [NASA-TLX]). They found a significant worsening association of increased NASA-TLX subjective workload ratings with odds of missed care (eg, each 5-point increase in a nurse's NASA-TLX rating during a shift was associated with a 34% increase in the likelihood of missing a nursing assessment for his or her assigned infants during the same shift). The authors conclude that subjective workload represents an important aspect of nurse workload that remains largely unmeasured despite high potential for intervention.

Another study, conducted in the US ([Brooks Carthon 2019](#)), surveyed nurses in almost 600 hospitals in 4 states and looked at factors that led to nurses giving their hospital poor or failing patient safety grades. A 1-unit increase in "engagement" lowered the odds of an unfavorable safety grade by 29%. Hospitals where nurses reported higher levels of engagement were 19% less likely to report that mistakes were held against them. And, nurses in poorly staffed hospitals were 6% more likely to report that important information about patients "fell through the cracks" when transferring patients across units.

Most of the studies on missed care have come from med/surg units or ICU's. A recent study administered the MISSCARE questionnaire (see our May 9, 2017 Patient Safety Tip of the Week "[Missed Nursing Care and Mortality Risk](#)") to nurses in a cancer center ([Villamin 2019](#)). Frequently perceived elements of missed nursing care were ambulation,

turning every 2 hours, and care conference attendance. Surgical units reported 0.24 higher scores than medical units, and hematology units reported 0.26 lower scores than surgical units. The authors note that the findings suggest that perceived missed care in a comprehensive cancer center is similar to that in other hospital settings.

We continue to be strong believers that nursing staffing levels do influence patient outcomes. But as we've discussed in so many prior columns, there needs to be a match between staffing levels and nursing **workload**. Patient acuity is only one potential component of workload. In our prior columns we noted several tools that have been used as better measures of nursing workload. The time has come for a randomized study that compares current staffing practices with practices that take into account nursing workload. Such a study will not be easy to do. First, you need to decide the unit of randomization (will it be at the hospital level, or do you compare ICU vs. ICU, or med/surg unit vs. med/surg unit). Then you need to apply an appropriate measure of workload. And, the most difficult task will be determining how the intervention (that is, adjusting the nurse staffing each day or each shift based upon the workload measure) will be implemented. Lastly, it will be difficult to exclude some element of bias. We would anticipate that more nurses may try to be scheduled to work on the "intervention" units because they may anticipate a better work environment. The latter may be a reason to randomize at the hospital, rather than unit, level but it would likely be more difficult to account for confounding factors (patient severity, socioeconomic factors, etc.) at the hospital level.

Some of our other columns on nursing workload and missed nursing care/care left undone:

November 26, 2013 "[Missed Care: New Opportunities?](#)"
May 9, 2017 "[Missed Nursing Care and Mortality Risk](#)"
March 6, 2018 "[Nurse Workload and Mortality](#)"
May 29, 2018 "[More on Nursing Workload and Patient Safety](#)"
October 2018 "[Nurse Staffing Legislative Efforts](#)"

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