

2014 regulations led to modest staffing increases but no reduction in rates of patient mortality or complications

Mass. ICU nurse staffing regulations did not improve patient mortality and complications

BOSTON, MA, USA (September 4, 2018) -In 2014, Massachusetts lawmakers passed a law requiring a 1:1 or 2:1 patient-to-nurse staffing ratio in intensive care units (ICU) in the state, as guided by a tool that accounts for patient acuity and anticipated care intensity. The regulations were intended to ensure patient safety in the state's ICUs, but new research led by physician-researchers at Beth Israel Deaconess Medical Center (BIDMC) and published today in [Critical Care Medicine](#) found the staffing regulations were not associated with improved patient outcomes.

"We hypothesized that Massachusetts ICU nurse staffing regulations would result in decreased complications and mortality for critically ill patients when compared with patients admitted to ICUs across the country unaffected by Massachusetts regulations," said lead author Anica C. Law, MD, core faculty at the Center for Healthcare Delivery Science and staff physician in the Division of Pulmonary, Critical Care, and Sleep Medicine at BIDMC. "But we did not identify improvements in patient outcomes associated with the state's nursing requirements."

The research team examined records from 246 medical centers nationwide, comparing patient outcomes in Massachusetts' six academic ICUs with outcomes in 114 out-of-state academic ICUs before, during and after the state mandate was implemented.

The Massachusetts regulations mandated 1:1 or 2:1 patient-to-nurse ratios, based upon patient acuity and anticipated care intensity. Academic ICUs were required to comply with the new regulations by March 31, 2016, while all other hospitals had until January 31, 2017. Analyzing tens of thousands of ICU admissions records, Law and colleagues focused on the change in mortality rates for patients in Massachusetts' academic ICUs before and after the mandate was implemented, compared with patients hospitalized in out-of-state hospitals; other analyses looked at changes occurring at community, non-academic ICUs and among a group of the sickest patients who received support from a ventilator. The team also analyzed the rate of complications, including central line-associated bloodstream infections, catheter-associated urinary tract infections, hospital-acquired pressure ulcers and patient falls with injury.

The researchers found modest increases in ICU nurse staffing ratios in Massachusetts before and after the mandates implementation, demonstrating a change from 1.38 patients per nurse to 1.28 patients per nurse. However, these increases were not significantly higher than staffing trends in states without state-mandated ICU staffing regulations, suggesting nurse staffing increases in Massachusetts could not be attributed to the state legislation. Law and colleagues also found that risk of mortality and risk of complications in Massachusetts' ICUs remained stable after the law's implementation, with no significant difference in trends compared to out-of-state hospitals.

"Our results suggest that the Massachusetts nursing regulations were not associated with changes in staffing or patient outcomes," said Law. "The modest changes in nurse staffing we saw in Massachusetts - approximately one extra nurse per 20-bed ICU per 12-hour shift - remained unassociated with changes in hospital mortality."

In addition to Law, co-authors include Jennifer P. Stevens, MD, MS, of Beth Israel Deaconess Medical Center; Samuel Hohmann, PhD, of Viziant Center for Advanced Analytics; and senior author Allan J. Walkey, MD, MS of Boston University School of Medicine and Boston University School of Public Health.

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