

Nurse staffing and mortality in stroke centers

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Hospital staffing levels have been associated with patient outcomes, but staffing on weekends has not been well studied, despite a recent UK mandate to make physician specialist care 7 days a week a policy and service improvement priority for the National Health Service. To help address the paucity of research on the association of weekend staffing with patient outcomes, Dr. Benjamin Bray of King's College London and Royal College of Physicians, United Kingdom, and colleagues conducted a prospective cohort study of weekend staffing with stroke specialist physicians for patients admitted to 103 stroke units in England, published in this issue of *PLOS Medicine*.

Bray and colleagues analyzed data from 56,666 patients with [stroke](#) admitted between 1 June 2011 and 1 December 2012, collected for a national register of stroke care in England. They found that of patients admitted to a stroke service, patient [mortality risk](#) did not differ whether stroke specialist physician rounds were 7 days per week or fewer than 7 days per week. However, when Bray and colleagues evaluated [nurse staffing](#) ratios, they found that patients admitted to hospitals with the lowest weekend ratios of registered nurses to patient beds had the highest mortality risk. Weekend nurse staffing was also closely correlated with nurse staffing during the week. After confounding factors were adjusted for, patients admitted to a stroke unit with 1.5 registered nurses/ten beds had an estimated adjusted 30-d mortality risk of 15.2% compared to 11.2% for patients admitted to a unit with 3.0 nurses/ten beds, equivalent to one excess death per 25 admissions. The authors acknowledge that because the study is observational, there could

be unmeasured characteristics of stroke services that differ between groups.

The authors interpret these results: "The lack of an association of mortality with daily physician ward rounds might be explained by the observation that the majority of units not providing rounds 7 d/wk instead had rounds 5 d/wk: the difference in patients' exposure to the frequency of physician rounds was therefore small. By contrast, weekend nursing ratios were strongly associated with mortality outcomes, not only for patients admitted on a weekend but also for those admitted on a weekday."

They conclude, "Controlled studies of different models of physician and nursing staffing seem both feasible and important, given the potentially large impact on [patient outcomes](#) and the high costs to health systems of increasing staffing levels on weekends. In the meantime, these data support the provision of higher weekend registered nurse/bed ratios in [stroke units]."

According to Meeta Prasad Kerlin (Perelman School of Medicine at the University of Pennsylvania), author of an accompanying Perspective, few rigorous studies have evaluated the association of weekend and evening staffing with patient outcomes, and most research to date has addressed physician staffing. However, prior research has found that higher nurse staffing levels are associated with better patient outcomes. Despite this evidence, there have been no randomized trials to establish definitively that increasing the number of nurses caring for patients can improve outcomes, such as would be required for other non-organizational interventions. Kerlin says, "Knowing that nurses are in short supply, and that their greater presence is beneficial, the next steps must be taken to understand how best to allocate the limited workforce and what creative solutions can mitigate the effects of different staffing levels."

More information: Bray BD, Ayis S, Campbell J, Cloud GC, James M, et al. (2014) Associations between Stroke Mortality and Weekend Working by Stroke Specialist Physicians and Registered Nurses: Prospective Multicentre Cohort Study. *PLoS Med* 11(8): e1001705. [DOI: 10.1371/journal.pmed.1001705](https://doi.org/10.1371/journal.pmed.1001705)

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