Duty Hour Reform Through the Eyes of Neurological Surgery Residents

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In a national survey of US residents in neurological surgery, performed before the implementation of the Accreditation Council for Graduate Medical Education (ACGME) 2011 duty hour standards,¹ nearly 75% of respondents felt further reduction in duty hours would have a negative effect on their training. Most respondents predicted a marked decrease in operative volume, increases in duty hour violations, and increases in medical errors because of suboptimal patient handoffs. Respondents did not answer a single question in the survey in favor of the new duty hour limits. This is particularly intriguing given that more than 5% of respondents indicated they had made a medical error causing patient harm at the end of an extended shift, and more than 8% indicated they had been in a life-threatening event (such as an automobile accident) while leaving the hospital after an extended shift. Furthermore, 36% of residents reported occasionally or frequently violating the duty hour limits. Although similar sentiments have been shared by residents and program directors in other specialties,²⁻⁴ neurological surgery residents disproportionately appear to harbor negative feelings toward duty hour restrictions.

Neurological surgery generally is regarded as one of the most difficult, demanding, and stressful specialties within medicine. Residents must gain competence in surgical procedures that can be long, complex, and emergent; manage patients that are tenuous and critically ill; and make critical decisions during stressful moments that may significantly impact outcomes. Many of these skill sets are acquired and honed during neurosurgical call, a period of intense mental and physical demands.⁵ Although neurological surgery residents account for about 1% of the total number of resident physicians in the United States, residency programs in this specialty accounted for a disproportionate number of requests to the ACGME to extend the weekly limit to 88 hours. Neurological surgery currently is the only specialty for which the ACGME Residency Review Committee still grants duty hour extensions, and 12% of neurosurgical programs operate under such an exception (P. Derstine, written communication, July 2012).

Why would neurological surgery residents, who work long hours, recognize that they have made harmful medical errors, and are at risk for life-threatening events after long shifts, be opposed to duty hours restrictions? After all, are they not the exact group to be targeted with such regulations?

The likely reason is that many neurosurgical residents identify the new duty hours policy as a barrier to good patient care and good education, and there is little evidence demonstrating that the duty hour limits have enhanced patient safety.^{1,6-9} Systematic reviews of published studies evaluating duty hours, clinical performance, and medical errors form the basis of the ACGME's new 2011 duty hour standards^{6,7}; however, these reviews demonstrate that the scientific evidence underlying the standards is weak. For example, the most controversial new element of the 2011 duty hour standards,^{1,2,4,8} the reduction in length of the continuous duty period for first-year residents to 16 hours, is based almost exclusively on data from a single study of interns in a medical intensive care unit.⁹

In addition, the duty hour limits have had an unclear effect on the surgical caseload of residents or fellows, with some studies indicating no effect¹⁰⁻¹² and others suggesting a decrease in operative volume.¹³ Sleep studies have shown no appreciable difference in daytime sleepiness of rested and postcall residents, which suggests that the duty hours mandate does not necessarily ensure that residents are well rested.^{14,15} A candid review of the published literature on these issues demonstrates the paucity of data supporting the changes: most evidence was generated from small, single-institution studies with questionable generalizability or from large-scale studies that lack internal validity because of numerous confounding factors. Based on a summary of the existing evidence, duty hour regulations appear to have had no appreciable effect on clinically relevant patient care metrics or trainee competencies.

Herein lies the crux of the duty hour debate: there are few data to support duty hour limits as improving patient care or reducing medical errors and few data examining the effects of the limits on resident education. Thus, duty hour reform appears based on the assumptions that (1) duty hours restrictions *probably* reduce errors, and (2) duty hour restrictions *probably* do not negatively affect resident training.

The problematic aspect of these assumptions is that duty hour limits likely have a larger effect on the day-to-day activities of neurological surgery residents. Neurological

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surgery represents a small specialty, with a resident complement between 1 and 3 residents annually at any single institution. The census counts of neurological surgery patients are frequently as numerous as those of other services and may include more critically ill patients. To continue to learn while immersed in patient care responsibilities, residents may attempt to accomplish more tasks during the shorter periods that are now allotted. Residents who are rushed to complete work may spend less time counseling patients to avoid duty hour violations. Proper patient encounters and thorough documentation of those encounters may be compromised. Opportunities for didactic education may be sacrificed to compensate for time restrictions. Residents may be forced to leave the operating room to avoid working beyond duty hours limits and may miss key learning points of an operation; and that may occur even when the resident has been present since the initial skin incision. Pressure to keep violations to a minimum—exerted both by the ACGME toward programs and by programs and sponsoring institutions toward their residents—and pressure to complete too much work in too little time has resulted in a culture where underreporting of hours is common. Early studies of general surgery and family medicine residents demonstrated that nearly 50% and 20% of residents underreported duty hours, respectively.^{16,17} Although not studied in neurosurgeons, the prevalence of underreporting within our field may be similarly high or even higher. Another factor that may potentially frustrate surgical residents is that surgeons are poorly represented on both the Institute of Medicine¹⁸ and the ACGME task forces that made decisions about duty hour limits for *all* residents. These factors lead residents in surgical specialties to argue that duty hours should be specialty specific,^{1,3} perhaps governed by individual Residency Review Committees. After all, why should a dermatology resident and neurological surgery resident, whose patients, responsibilities, procedures, and lifestyle differ so markedly, be subject to the same expectations in duty hours?

Although residents in neurological surgery constitute only a few of the residents overseen by the ACGME, this should not marginalize the community's role in influencing universal policies. This is particularly important given that neurological surgeons, along with other surgical specialties, are most affected by the duty hour limits. Going forward, the medical community should recognize that the effects of duty hours are not necessarily equal across specialties. Stakeholders with the most at stake (and, consequently, the most to gain) should be fairly represented in the discussions about duty hour reforms.

Ultimately, the solution will be better scientific evidence. Rigorous studies evaluating different work schedules and their effects on educational and patient outcomes may provide the most valuable guidance for the future.¹⁹ Until there is a clear

benefit to neurosurgical patient outcomes under reduced duty hours, residents in neurological surgery will likely continue to oppose regulations that appear to compromise resident education and patient care.

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