Tides of change

The future of Canadian medical resident work hours

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ABSTRACT

The paradigm of medical resident duty hours is currently undergoing vast changes, as research has demonstrated the negative effects of sleep deprivation on the wellbeing of both patients and residents alike. These changes began in the United States, where reduced work hour schedules for residents have been implemented within the past decade. However, the effectiveness of these changes has been debated in the literature. In Canada, this issue has only recently come into spotlight. Under the guidance of the Royal College of Physicians and Surgeons of Canada, a task force was assembled in 2012 with two main objectives: gather all evidence related to resident duty hours, fatigue, and patient safety, and to create a national Canadian consensus on resident duty hours.

In 1984, New York City was the setting of a new wave of thinking about residency training programs within the medical profession. That year, the death of Libby Zion, a lawyer's daughter, initiated the Zion vs. New York Hospital case, which would have an indirect impact on international rules for resident work hours.

Traditionally, it was not uncommon for residents to work up to 36 consecutive hours with minimal sleep, accumulating well over 100 hours of work in a week. Some considered this a rite of passage into the medical profession, while others saw it as a valuable learning tool. When the death of teenager Libby Zion was traced down to a medical error, more attention was drawn to the effect of sleep deprivation on residents' performance on the wards.

What effect does sleep deprivation have on residents? One review found that with acute sleep deprivation, residents showed decreased performance on tasks that required prolonged, vigilant concentration, but were resilient in performing brief, psychomotor tasks requiring manual dexterity and short-term recall.¹ Furthermore, resident mood was affected, with increased anger, hostility, and symptoms of depression being noted – all factors that hinder the physician-patient relationship. In addition, one study found that extended shifts put residents' safety at risk, by increasing the likelihood of reporting a motor vehicle accident after a call shift.²

A landmark study published in the *New England Journal of Medicine* compared two different work schedules head-to-head.³ The first schedule, considered "traditional," had an average of 77-81 work hours per week with up to 34 hours of continuous work and 1 in 3 overnight call. The second, or "interventional" schedule, had 60-63 work hours per week maximum, 16 hours of continuous work maximum, and a day-call versus night-call designation, rather than a whole day of call. These schedules were randomized among internal medicine residents, and patient safety measures were prospectively followed. When researchers compared the traditional schedule

and interventional schedule respectively, they found that residents made 35.9% more serious medical errors (136.0 vs. 100.1 per 1000 patient-days), 22.0% more total medical errors (193.2 vs. 158.4 per 1000 patient-days), 20.8% more serious medication errors (99.7 vs. 82.5 per 1000 patient-days), and 96.5% more serious diagnostic errors (21.6 vs. 11.0 per 1000 patient-days), while on the traditional schedule.³

In light of these findings, in 2003 the Accreditation Council for Graduate Medical Education (ACGME) in the United States instituted limits on resident work hours: 16 hours maximum for continuous shifts for PGY-1 (more hours allowed for seniors), 80 hours maximum per week, and 1 day off per week averaged over a 4-week period.⁴ Any residency program's accreditation is endangered if their work protocols are not congruent with the ACGME. Unfortunately, data collected after these changes have shown mixed results as to the effectiveness of reduced hours. A systematic review of 7 studies (one of which was conducted after the 2003 ACGME changes) comparing reduced hour schedules with traditional schedules looked at mortality, adverse events, and medication errors as outcomes.⁵ The results showed that some outcomes improved, others declined, and still others showed no change. For example, mortality was largely unaffected by reduced hours, but medication errors were reduced.⁵ The authors emphasized a distinction between mortality outcomes, and task-based outcomes, the latter of which may be more susceptible to sleep deprivation. Although there were limitations within the studies in this review, such as the failure to measure baseline characteristics, the point is raised that reduced-hour schedules may not have the effects that were once anticipated.

There may be negative consequences with reduced hour work schedules. Proponents of the traditional, long hour work schedules raise the argument that by reducing hours and increasing patient hand-over, an element of discontinuity is introduced which in itself may increase medical errors. In addition, fewer predictable hours may not prepare residents for independent practice, where hours are not limited and may be unpredictable. This may be reflected by an increase in the length of residency programs to allow for adequate clinical exposure. A survey of surgical residents in the United States found that many are unsatisfied with the reduced work-hour changes: 55.1% believed their education declined, and 68.4% felt they were not being prepared for senior roles.⁶ Although 61.9% of junior surgical residents had an increase in their quality of life, 54.4% of senior residents found a decline in their quality of life, likely due to seniors adopting the work that the juniors could not complete on their reduced hour schedules. Shockingly, 67.6% of surgical residents reported non-compliance with the work-hour limits, and 62.1% reported falsifying duty hours.⁶

In Canada, the resident association of each province has the daunting task of negotiating collective agreements for medical res-

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idents. Presently, Quebec has been the only province to introduce drastic changes to their collective agreement regarding work hours. In 2007, the collective agreement of the Fédération des médecins résidents du Québec, which at the time permitted 24-hours of consecutive work, was challenged under the grounds that it violated both the Canadian Charter of Rights and Freedoms and the Quebec Charter of Human Rights and Freedoms.⁷ Four years later, in 2011, a new collective agreement was signed, stating that residents will work no more than 16 consecutive hours. The total weekly hours will remain approximately the same—the hours will simply be re-distributed.⁷

Where is the rest of Canada heading in terms of resident work hours? In 2012, the Royal College of Physicians and Surgeons of Canada launched a project titled, “Towards a Pan-Canadian Consensus on Resident Duty Hours.”⁸ By creating a National Steering Committee on Resident Duty Hours (NSC) consisting of multiple stakeholders involved in resident training, and taking an evidence-based approach, the Royal College hopes to develop national Canadian recommendations on resident duty hours. The goals of the project are to (1) compile all current evidence on this topic, and (2) facilitate, “...educators, governments, policy makers, patient safety experts, and others, to come to a single, pan-Canadian statement on resident duty hours issues, directions, and best practices.”⁸

In June of 2013, the NSC released the final results of their project. Firstly, the NSC does not support reducing the total number of work hours, but rather re-distributing the hours such that long stretches of consecutive hours are minimized.⁸ Secondly, the original rationale behind reduced hours was the notion that resident fatigue impacts patient outcomes. However, evidence collected by the NSC has been inconclusive as to whether reduced duty hours improves patient outcomes. Why is this the case? The relationship between resident fatigue, medical errors, and patient safety is not as clear as once anticipated.⁸ Fatigue does not affect each resident the same way, nor is sleep-deprivation the only factor that influences fatigue.⁸ Although the NSC does acknowledge that current schedules pose risks to the, “physical, mental, and occupational health of residents,” they emphasize that we must not place the spotlight entirely on duty hours, but rather take a comprehensive, holistic approach by addressing factors beyond duty hours alone.⁸ Additional factors to be considered include resident education, health service delivery, and resident supervision.⁸

The NSC also acknowledges significant variation between residency programs, and that reduced consecutive hours may affect each specialty program differently.⁸ Changes must be tailored specifically for each type of residency, rather than making uniform changes across all different residency programs.

The NSC has provided five key recommendations for Canadian residency programs, in accordance with their findings.⁸

1. We need a comprehensive approach to minimize fatigue-related risk, including “fatigue-risk management plans” in all residency programs across Canada.
2. Resident education needs to be re-modeled, along with resident duty hours, to ensure adequate medical training and exposure for residents.
3. Residency programs need to be held accountable for maintaining these changes through accreditation processes.

4. Multiple models of work schedules for after-hours care should be created and evaluated as to their impact on patient care.
5. An independent, pan-Canadian council, whose sole purpose is to evaluate resident duty hours, should be created.

These changes appear promising to both patients and residents in Canada, however the NSC was not specific as to the timeline for residency programs to adopt these changes. It may be some time before new schedules are formulated and adopted across Canadian residency programs.

Picture the following scenarios: a well-rested resident caring for patients mainly through reports, or a fatigued resident providing direct patient care through their own history and physical examination. Who provides the best patient care? Working long consecutive hours has disadvantages for both the patient and resident alike, however, reducing duty hours also has its own disadvantages. It is important to study the disadvantages of reduced consecutive-hour schedules, so that they may be minimized or eliminated during the policy-making process. Canada has taken the first step towards addressing this issue by compiling a task force whose aim was to create an evidence-based, pan-Canadian guideline regarding resident duty hours. With the NSC’s final report, Canada is headed towards changes which will ultimately improve the health-care of Canadian citizens and simultaneously maximize the health and education of medical residents.

REFERENCES

1. Samkoff JS, Jacques, CHM. A review of studies concerning effects of sleep deprivation and fatigue on residents’ performance. *Acad. Med.* 1991 Nov;66(11):687-93.
2. Barger LK, Cade BE, Ayas NT, Cronin JW, Rosner B, Speizer FE, Czeisler, CA. Extended work shifts and the risk of motor vehicle crashes among interns. *N Engl J Med.* 2005 Jan;352(2):125-34.
3. Landrigan CP, Rothschild JM, Cronin JW, Kaushal R, Burdick E, Katz JT, et al. Effects of reducing interns’ work hours on serious medical errors in intensive care units. *N Engl J Med.* 2004 Oct;351(18):1838-48.
4. Accreditation Council for Graduate Medical Education [Internet]. 2003 Jan [updated 2010 Sept 26; cited 2013 April 28] Available from: http://www.acgme.org/acgmeweb/Portals/0/PFAssets/ProgramResources/Common_Program_Requirements_07012011%5B1%5D.pdf.
5. Fletcher KE, Davis SQ, Underwood W, Mangrulkar RS, McMahon LF Jr, Saint S. Systematic review: effects of resident work hours on patient safety. *Ann Intern Med.* 2004 Dec;141(11):851-7.
6. Drolet BC, Sangisetty S, Tracy TF, Cioffi WG. Surgical residents’ perspectives of 2011 Accreditation Council for Graduate Medical Education Duty Hour Regulations. *Jama Surg.* 2013 May;148(5):427-33.
7. Lajoie MB. End of 24-hour institutional on-call duty in Quebec. *Can Fam Physician.* 2012 May;58: e296-7.
8. Royal College of Physicians and Surgeons of Canada. National Steering Committee on Resident Duty Hours [Internet]. [updated 2013 June; cited 2013 September 8]. Available from: www.residentdutyhours.ca.