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## POSITION PAPER

# Canadian Patient and Physician Safety and Wellbeing: Resident Duty Hours

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Resident Doctors of Canada (RDoC) represents over 9,000 resident doctors across Canada. Established in 1972, we are a not-for-profit organization providing a unified, national voice for our membership. RDoC collaborates with other national health organizations to foster excellence in training, wellness, and patient care.

# Canadian Patient and Physician Safety and Wellbeing: Resident Duty Hours

Resident physicians are in a unique position being both learners and frontline care providers in our health care system. To date, fulfilling this dual role has meant resident physicians often spend lengthy consecutive hours on duty, providing patient care.<sup>i</sup> Recently, there has been increasing attention on one particular aspect of physician wellbeing - fatigue that is associated with (but not limited to) excessive continuous duty hours and the implications that the current duty hours model has for the safety of patients and residents, as well as residents' wellbeing and ability to learn. One thing that is clear from recent studies is that our current model of training is neither physiologically feasible nor sustainable.



The issue of duty hours is especially important to residents, as it is a key factor in our education and training. There has been much research done to date in this area. Examining residency duty hours allows the opportunity to evaluate and refine our current model of training by working towards optimizing our educational experience to ensure training is efficient and effective during residency. In alternate training models, hours may be redistributed in a schedule to optimize learning, minimize fatigue, and improve physician wellbeing, thereby improving efficiency and precluding any need to lengthen the amount of training.

Many jurisdictions both internationally and within Canada, and in particular Québec, have acknowledged these concerns and have implemented different strategies for addressing this issue. These strategies include placing restrictions on both the number of continuous and cumulative duty hours and how these hours are structured. For instance, in the United States, the Accreditation Council for Graduate Medical Education (ACGME) employs a ceiling of 80 hours that resident physicians are permitted to be on duty per week (including call) and a maximum duty period of 16 hours for first year residents.<sup>1</sup> In Europe, the Working Time Directive mandates that physicians in training work no more than an average of 48 hours per week, with a maximum duty period of 13 continuous hours.<sup>2</sup> New Zealand and Australia have mandated similar duty hour restrictions. While there is no single solution that will work for all programs, alternative models have been successfully implemented in post-graduate medical education, eliminating 24-hour call periods with alternative schedules.

Currently there is no pan-Canadian limitation on resident duty hours. Duty hours are negotiated individually within each province. Manitoba and the Maritime provinces do have a weekly duty hour limit of 89 hours per week and 90 hours per week (averaged over four weeks), respectively.<sup>3,4</sup> In Québec, residents' duty hours are limited to an average of 72 hours per week over a 28-day rotation period. Additionally, a Québec arbitration ruling in June 2011 ordered that resident duty hours be reduced to a maximum of 16 consecutive hours per day, stating that a 24-hour duty period is a violation of the Canadian Charter of Rights and Freedoms and the Québec Charter of Human Rights and Freedoms.<sup>5</sup>

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<sup>i</sup> Fatigue and its impact on patient care and physician wellbeing is not limited to residents in training. Fatigue also affects physicians in practice. While an examination of duty hours and physicians in practice is beyond the scope of this document, RDoC anticipates exploring this issue further through collaboration with key stakeholders.

## Recommended actions

Providing patient care in a safe and ethical manner is intrinsic to professionalism, one of the core values of the medical profession. Therefore RDoC is fully supportive of regional, provincial, and national efforts to manage resident duty hours in a manner that ensures patient safety, protects the safety and wellbeing of all physicians, and provides an optimal educational experience for Canada's residents.<sup>ii</sup>

Acknowledging the urgency of this issue, RDoC calls on all PGME departments, employers, governments, and other relevant stakeholders to ensure the following with respect to call duty and resident duty hours.

1. Resident physicians' duty hours must be managed such that they do not in any way endanger their health or the health of patients. In particular, limits are required on the number of continuous uninterrupted hours that residents are on duty. In keeping with current evidence, RDoC urges that all provinces and regions in Canada work towards a system that limits continuous uninterrupted duty hours to 16 hours or less at a time.<sup>iii</sup> Additionally, the scheduling of duty hours must allow for adequate time in-between work periods to eliminate the effects of sleep deprivation. This limitation will enhance residents' ability to provide safe, high quality patient care, while protecting their own personal health and safety.
2. Resident duty hours must be such as to allow for an optimal educational experience. Specifically, trainees' duty hours must not impair their ability to learn or to train others.
3. Residents must be formally trained in handover skills, the ability to transfer care appropriately when going off duty.
4. Resident duty hours should be flexible enough to accommodate the specific context of the resident's role and the service needs on particular rotations.
5. The management of duty hours should parallel a change in the culture of medicine that addresses the effects and consequences of uninterrupted consecutive duty hours for the medical profession as a whole, including staff physicians and non- resident learners.
6. Where a violation of Federal or Provincial ethical, legislative, or legal standards has occurred, including but not limited to those related to the Canadian Charter of Rights and Freedoms, RDoC calls upon all stakeholders to address and remedy the situation as swiftly as possible.

## Evidence

Much research has been done in the area of physician fatigue. Excessive duty hours endanger public and physician safety, not only through increased medical errors, but also through other fatigue related events, such as motor vehicular accidents. The impact of working continuous long hours can have not only negative health implications but also decrease the ability to learn.<sup>6</sup>

The Institute of Medicine (IOM), in its exhaustive 2009 study, *Resident Duty Hours: Enhancing Sleep, Supervision, and Safety*, is categorical in assessing the effect of fatigue on patient & provider safety – “there is extensive research that shows that fatigue is an unsafe condition that contributes to reduced wellbeing for residents and increased errors and accidents”.<sup>7</sup> The report also states that, “The evidence reviewed...

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ii RDoC recognizes that duty hours is one aspect of the broader issue of physician wellbeing, which affects Canadians in all walks of life. Moving ahead, RDoC will continue to publish on other aspects of the over-arching issue of physician wellbeing.

iii There is now compelling evidence that permitting duty hours of up to 24 hours exceeds the maximum safe limit; there is also a growing body of evidence for limiting duty hours to no more than 16 hours. Given that research is ongoing in this field, RDoC will be following this issue closely and may adapt its recommendations in the future if compelling evidence arises.

supports the conclusion that performance is compromised by remaining awake beyond 16 hours. Therefore extended duty shifts (24 + 6 hours)... promote conditions for fatigue-related errors that pose risks to both patients and residents. Limiting continuous work time to 16 hours would reduce these risks.”<sup>8</sup>

The following table identifies findings from a selection of key studies regarding the effect of fatigue on patient safety and care, resident safety and wellbeing, and learning:

PATIENT SAFETY/CARE	RESIDENT SAFETY/WELLNESS	COGNITION/ABILITY TO LEARN
5-36% of all resident errors were caused by fatigue (IOM, 2009). <sup>9</sup>	First year residents reported a higher rate of injury (exposure to contaminated bodily fluids, percutaneous injuries) when fatigued (Ayas et al, 2006). <sup>10</sup>	There is a significantly higher rate of falling asleep during lectures as the number of extended duration shifts worked in a given month increases (Barger et al, 2006). <sup>11</sup>
Residents who worked over 80 hours/week had 8:1 odds ratio of having a patient who’s had an adverse event that week (Jagsi et al, 2005). <sup>12</sup>	Residents were most exposed to blood-borne pathogens through needle punctures or cuts during overnight duty periods (Parks et al., 2000). <sup>13</sup>	Staff physicians who were on call overnight were found to have reduced performance in standard cognitive performance tests (Robbins and Gottlieb, 1990). <sup>14</sup>
Randomized controlled trial of duty hours reduction found significantly higher occurrence of serious medical errors with longer duty hours and less sleep (Landrigan et al., 2004). <sup>15</sup>	A 2005 survey found that residents were 2.3 times more likely to be involved in a motor vehicle crash after working an average of 32 hr shifts (Barger et al., 2005). <sup>16</sup>	One night without sleep reduced third year resident’s performance on tests to the level of a first year resident (Jacques et al, 1990). <sup>17</sup>
Residents made twice as many errors reading ECGs after being awake for 24 hours (Freidman, 1971). <sup>18</sup>	Residents working shifts of over 24 hours were at greatly increased risk of an occupational injury, a vehicle crash after work, and serious or fatal medical errors (Lockley et al, 2007). <sup>19</sup>	Being awake more than 16 hours at a time had an effect on cognitive performance equivalent to 0.05 to 0.10 percent blood alcohol concentration (Arnedt et al., 2005; Lamond and Dawson, 1999; Dawson and Reid, 1997; Williamson and Feyer, 2000). <sup>20,21,22,23</sup>
Surgical residents who had been awake all night made 20% more errors in completing a simulated laparoscopic surgical task than those who had a full night’s sleep (Taffinder et al, 1998). <sup>24</sup>	A 2004 survey of R1 and R2 residents found those who reported obtaining less than five hours of sleep per night were more likely to report increased use of alcohol and medications (Baldwin and Daugherty, 2004). <sup>25</sup>	Memory consolidation requires sleep after initial training and affects how quickly learning is consolidated (Huber et al., 2004; Stickgold et al., 2000). <sup>26,27</sup>
Residents made more technical errors in simulated laparoscopic surgical skills after being awake through the night (Eastridge et al., 2003). <sup>28</sup>		

Over the course of June-July 2011, RDoC surveyed its membership nationally to gauge resident perceptions on various issues related to their training. In total, 1831 residents responded to the survey, representing a response rate of 22%. The following are key findings with respect to duty hours, and effects of fatigue and sleep deprivation.

- Over 80% of those surveyed, reported having experienced instances where the quality of their care had been compromised due to the number of consecutive hours they have been working.
- Almost 60% of residents felt they could only consistently provide safe, high quality patient care for 16 consecutive hours or less.
- 20% of residents indicated that their program offers any sort of training in duty hours and safety issues.
- Only half of residents reported receiving any sort of training in patient handover. Of those receiving training in transfer of care, over 70% felt that it improved their ability to provide safe, high quality care.

While there is recognition of the benefits of limiting duty hours, concerns have been raised that this will lead to increasing handovers, which could increase the risk of medical error. Thus attention must be focused on enhancing effective handovers. Formalized handovers have a positive effect on patient care by reducing serious medical errors, including decreased diagnostic errors and complications secondary to procedures.<sup>29</sup> For these reasons, RDoC advocates for mandatory formal training on how to conduct transfer of care/handovers for all residents in Canada.<sup>30</sup>

## Alternative models for duty hours/call

Given the evidence of negative outcomes in physician and patient safety and wellbeing associated with fatigue, sleep deprivation, and prolonged continuous work, there have been various attempts to rearrange call schedules so as to ensure that physicians are not sleep deprived and fatigued. The primary focus has been on limiting the number of consecutive duty hours, while simultaneously ensuring that trainees receive adequate exposure to learning opportunities.

A number of different strategies have been implemented that allow residents to perform their clinical duties and partake in educational sessions, without having to be on duty continuously for 24 hours. These include a night-float system, staggered shifts, reordering of call responsibilities, and many more.<sup>31</sup> In addressing this issue, we acknowledge that different models are needed to address the unique aspects of programs across our country. Alternative models may be required for rural sites, remote sites, community locations, and/or academic centres. There may also be the need to account for differences in specialty-specific call volumes, differences in numbers of trainees, allied health care professionals and/or staff physicians in a region, to avoid the effects of chronic sleep deprivation and fatigue.



It must be acknowledged that decreasing consecutive hours on duty is just one way that the issue of physician and patient safety and wellbeing can be addressed. RDoC will continue to investigate and evaluate different methodologies of improving physician wellbeing while enhancing patient safety and fostering an optimal educational environment.

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