

Revisiting Duty-Hour Limits — IOM Recommendations for Patient Safety and Resident Education

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On December 2, about 5 years after the Accreditation Council for Graduate Medical Education (ACGME) imposed national limits on the duty hours of medical residents, the Institute of Medicine (IOM) issued a report recommending that further measures be taken to ensure that hospitals provide safer conditions for patients and trainees while maintaining rigorous teaching programs.¹ The report concludes that these new measures should be focused on alleviating fatigue and loss of sleep among trainees, increasing their supervision by more senior physicians, improving the processes by which responsibilities for patients are transferred from physicians going off duty to those coming on, and stiffening enforcement by initiating federal oversight of the regulations established by the ACGME. The report, issued by the IOM's Committee on Optimizing Graduate Medical Trainee (Resident) Hours and Work Schedules to Improve Patient Safety, estimates that the cost of implementing some of the recommendations — of recruiting and paying the personnel necessary to substitute for residents — would be “in the ballpark of \$1.7 billion.”

The study was undertaken at the request of the House Committee on Energy and Commerce as part of its investigation into preventable medical errors. In a March 29, 2007, letter to the Agency for Healthcare Research and Quality, which contracted with the IOM

to conduct the inquiry, Committee Chairman John Dingell (D-MI), ranking Republican Joe Barton of Texas, and two senior colleagues (Democrat Bart Stupak of Michigan and Republican Ed Whitfield of Kentucky) wrote that their interest had been “recently heightened” by a study that “found medical errors resulting in adverse events, including death, due to sleep-deprived and over-extended medical residents and interns, substantiating previously held concerns about physician work schedules.”^{2,3}

The initial regulations recommended by the ACGME — which accredits most of the 8500 residency programs that currently provide advanced training to some 105,000 medical school graduates — were developed to address concerns about preventable medical errors and to avert any action by the federal government. They were the first set of national work-schedule limits that applied to residents in all specialties; the limits went into effect on July 1, 2003. In addition to creating other rules, the ACGME said that residents' duties must be limited to an 80-hour workweek, averaged over 4 weeks, including all in-house call. New York State had previously set limits when resident duty hours came under public scrutiny after the 1984 death of Libby Zion in an emergency room in New York City. A grand-jury investigation highlighted the risks to patient safety posed by residents who were inadequately

supervised and very fatigued. In 1989, New York State established a limit on resident duty of 80 hours per week averaged over 4 weeks; this limit became the basis for the ACGME's national rules.

Graduate medical training programs have traditionally required residents to work long hours in order to gain the experience necessary to become well-qualified physicians. The IOM committee said that “a robust evidence base linking fatigue with decreased performance in both research laboratory and clinical settings” indicates that new changes should focus on ways of preventing fatigue whenever possible and mitigating fatigue “when residents must be on duty by allowing for sleep during extended duty periods and adequate time for recovery sleep while off duty.” Although some might propose further reductions in total duty hours, the report notes, “evidence suggests it is an indirect and inefficient approach given the moderate correlation that exists between resident duty hours and sleep time.”

The committee recommends that the current limit of an 80-hour workweek, averaged over 4 weeks, be maintained to ensure sufficient flexibility for specialty-specific educational purposes (see table). To directly tackle the problem of fatigue, the committee focuses on ways of alleviating both acute and chronic sleep deprivation. Specifically, it recommends that duty periods running

Comparison of IOM Committee Adjustments with Current ACGME Duty-Hour Limits.		
Variable	2003 ACGME Duty-Hour Limits	IOM Recommendation
Maximum hr of work per wk	80 hr, averaged over 4 wk	No change
Maximum shift length	30 hr (admitting patients up to 24 hr, then 6 additional hr for transitional and educational activities)	30 hr (admitting patients for up to 16 hr, plus 5-hr protected sleep period between 10 p.m. and 8 a.m., with the remaining hours for transitional and educational activities) 16 hr with no protected sleep period
Maximum in-hospital on-call frequency	Every third night, on average	Every third night, no averaging
Minimum time off between scheduled shifts	10 hr after shift	10 hr after day shift 12 hr after night shift 14 hr after any extended duty period of 30 hr, not returning until 6 a.m. of next day
Maximum frequency of in-hospital night shifts	Not addressed	48 hr off after 3 or 4 nights of consecutive duty
Mandatory time off	4 days per mo 1 day (24 hr) per wk, averaged over 4 wk	5 days per mo 1 day (24 hr) per wk, no averaging One 48-hr period per month
Moonlighting	Internal moonlighting counted against 80-hr weekly limit	Internal and external moonlighting counted against 80-hr weekly limit All other duty-hour limits apply to moonlighting in combination with scheduled work
Limit on hours for exceptions	88 hr for select programs with a sound educational rationale	No change
Emergency room limits	12-hr shift limit, at least an equivalent period of time off between shifts; 60-hr workweek with additional 12 hr for education	No change

longer than 16 hours be required to include a 5-hour, uninterrupted period of continuous sleep between 10 p.m. and 8 a.m., during which residents are free from all work and call; that residents not be permitted to admit new patients after 16 hours on duty; and that night-float or night-shift duty not be permitted to exceed four consecutive nights and be followed by a minimum of 48 continuous hours off duty.

Graduate medical education programs are designed to grant residents progressively greater responsibility for patient care — to equip them with the skills necessary to practice medicine independently. The committee argues that “supervision is the single most important element upon which this education model de-

pends.” In light of that priority, the report “raises concerns regarding the current application of supervisory practices in the context of both learning and patient safety.” In an effort to increase safety and improve residents’ education, the committee argues, “the ACGME should ensure that programs provide adequate, direct, onsite supervision for residents.” First-year residents, in particular, should have “immediate access” to an in-house supervisory physician who has been approved by the residency program. In addition, the committee believes that the ACGME should require “Residency Review Committees, in conjunction with teaching institutions and program directors, to establish measurable standards of supervision for each

level of doctor in training, as appropriate to their specialty.”

People invited to present their views to the committee agreed that the 2003 limits on duty hours have resulted in an increase in handoffs of patient care between physicians — transitions associated with increased risks to patient safety. The report discusses many aspects of effective hand-off procedures, but its recommendations in this area are quite general — for instance, that teaching programs “should train residents and teams in how to hand over their patients using effective communications” and that “the process should include a system that quickly provides staff and patients with the name of the resident currently responsible, in addition to the name of the attending

physician.” The committee notes that training programs should also fully involve residents in the safety-reporting and quality-improvement systems of the teaching hospital as an integral part of their education.

The committee recognizes that nonadherence to duty hours “is substantial and underreported, and that more intensified monitoring is necessary immediately.” It found that residents fail to accurately report their duty hours for multiple reasons, including fear of repercussions from their supervisors or, at the extreme, fear of causing a training program to lose its accreditation. After considering other options for the establishment and monitoring of duty hours, the committee concluded that the most expeditious way to implement the recommendations is to use the existing structure of ACGME rather than to turn the focus toward passing new legislation and establishing another organizational entity for setting duty-hour limits and monitoring their implementation. Nevertheless, the committee says, to add weight to enforcement, “the Centers for Medicare and Medicaid Services should assess reliability of ACGME procedures and . . . sponsor periodic independent reviews of ACGME’s duty hour monitoring to determine the characteristics of and reasons for violations.” In addition, the Joint Commission (formerly, the Joint Commission on Accreditation of Healthcare Organizations) should use the ACGME’s adherence data in its hospital surveys and institutional accreditation process.

At a news conference on December 2, the chair of the IOM committee, Dr. Michael Johns

of Emory University, remarked that “these recommendations will make a difference only if the limits are being followed. . . . We call for the [ACGME] to strengthen its monitoring efforts by making more frequent duty-hour audits and making these visits unannounced. We also call for improvements in protections for those who report violations.”

In the course of its deliberations, the committee explored the experiences of other industrialized countries in relation to residency hours and found that the maximum allowable weekly duty hours ranged from 37 in Denmark to no established limit in Australia and Canada (although the province of Manitoba has a limit of 89 hours per week averaged over 4 weeks). Other weekly limits cited in the IOM report were 52.5 hours in France, 72 hours in New Zealand, 56 to 64 hours in the United Kingdom, and 48 hours under collective agreements of the European Commission.

The committee acknowledges that the two largest barriers to implementing its recommendations are the cost of doing so and the difficulty of finding an adequate number of other health care professionals who could do the work of residents. The committee commissioned health services researcher Teryl Nuckols and health economist José Escarce (both of UCLA and the RAND Corporation) to construct a model that would estimate the numbers of workers and the amount of money that would be required to supplement the resident workforce under various duty-hour scenarios. Nuckols and Escarce found that nationally the health care system would need to create and fill new full-time–

equivalent positions for 229 nursing aides, 45 laboratory technicians, 320 licensed vocational nurses, 5984 midlevel providers (nurse practitioners or physician’s assistants), and 5001 attending physicians; if hospitals were to increase the number of residents instead, an estimated 8247 additional residency positions would have to be created.

In developing its recommendations, the IOM committee struggled with tensions among its three objectives — improved patient safety, greater resident safety, and enhanced educational outcomes for residency training. Since compromises had to be made, the report is unlikely to leave any stakeholder entirely satisfied. A key question the House Committee on Energy and Commerce may well pose once it has an opportunity to examine the report closely is whether those compromises will make it impossible to reduce preventable medical errors.

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1. Resident duty hours: enhancing sleep, supervision, and safety: Committee on Optimizing Graduate Medical Trainee (Resident) Hours and Work Schedules to Improve Patient Safety. Washington, DC: National Academies Press, 2008.
2. Dingell JD, Barton J, Stupak B, Whitfield E. Letter written to William Munier, Agency for Healthcare, Research, and Quality. Washington DC: U.S. House of Representatives, Committee on Energy and Commerce, March 29, 2007.
3. Barger LK, Ayas NT, Cade BE, et al. Impact of extended-duration shifts on medical errors, adverse events, and attention failures. *PLoS Med* 2006;3(12):e487.

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