The 2011 Duty-Hour Requirements — A Survey of Residency Program Directors

Brian C. Drolet, M.D., Mamoona T. Khokhar, M.D., and Staci A. Fischer, M.D.

In 2010, the Accreditation Council for Graduate Medical Education (ACGME) released new Common Program Requirements designed to improve patient safety as well as resident education and quality of life.[1] These rules, which went into effect in July 2011 and introduced additional regulations related to duty hours and resident supervision, have already inspired considerable debate. In studies conducted before implementation, program directors and residents expressed mixed feelings about the potential effects of the new standards.[2,3] Although program directors supported the 80-hour workweek, the maximum frequency of in-house call, and mandatory off-duty time, they opposed limiting first-year residents to 16-hour shifts.[2] Residents expressed greater concern than program directors, fearing potential negative effects on quality of care, as well as resident education, experience, and preparedness for senior roles. The quality of life for residents was the only factor that they predicted might improve.[3]

In a national survey conducted between December 2011 and February 2012, residents reported no improvement in education, total number of hours worked, or the amount of rest they were getting. In fact, many participants described the changes as detrimental, with the majority feeling less prepared to take on more-

Table 1. Approval of ACGME Common Program Requirements.*

Requirement	Disapprove	Neutral	Approve
		% of respondents (99% CI)	
Direct supervision of PGY-1 residents	8.1 (3.4–11.1)	15.2 (11.3–19.1)	76.7 (72.1–81.4)
80-hr workweek	9.8 (5.0–13.1)	16.8 (12.7–20.9)	73.4 (68.5–78.3)
1 day off each week	2.6 (0.0–4.3)	9.7 (6.4–12.9)	87.8 (84.1–91.4)
16-hr shifts for PGY-1 residents	71.6 (67.8–76.5)	14.6 (10.7–18.5)	13.8 (10.0–17.6)
24+4-hr shifts for senior residents	26.8 (21.3–31.7)	25.2 (20.4–30.0)	48.0 (42.5–53.5)
8 hr off between shifts	10.8 (5.8–14.2)	18.9 (14.6–23.2)	70.3 (65.3–75.4)
Night-shift frequency of <7 consecutive days	15.0 (10.0–18.9)	14.5 (10.6–18.3)	70.5 (65.5–75.5)
Overall impression	25.5 (20.0–30.3)	27.9 (23.0–32.8)	46.7 (41.2–52.1)

* Program directors provided responses to the question, "Regarding the ACGME Common Program Requirements, please indicate your level of approval." The differences between proportions are significant if the 99% confidence intervals do not overlap. ACGME denotes Accreditation Council for Graduate Medical Education, CI confidence interval, and PGY-1 postgraduate year 1.

senior roles. Only quality of life for first-year residents was identified as having improved. The frequency of handoffs and workload for senior residents were both noted to have increased, whereas patient safety was deemed to be unchanged. Overall, only 22.9% of residents reported approval of the 2011 regulations.[4]

We sought to evaluate program directors' perceptions of the 2011 requirements 1 year after implementation. As practicing physicians and curriculum developers, program directors may be in a better position than residents to assess the effects of these regulations on patient care and resident education.

In June 2012, we attempted to survey all 829 directors of ACGME-accredited residency programs in general surgery, internal medicine, and pediatrics; we were able to find e-mail addresses for 785 of them (94.7%). After receiving approval from the Rhode Island Hospital institutional review board, we asked program directors by e-mail to participate in an anonymous electronic survey. Of the 785 available e-mail addresses, 55 (7.0%) were found to be nonfunctional, with no identifiable alternative. Three separate, individualized requests for participation were sent to each program director over the course of 6 weeks. The survey consisted of 32 questions, including 6 demographic questions and 1 open-response option. Program directors were asked to indicate their level of approval for various components of the 2011 requirements, the perceived effect on aspects of training and patient care, and compliance with resident duty hours.

A total of 549 responses were obtained from the 730 eligible participants (75.2%). The majority of respondents were men (69.0%), were 41 to 60 years of age (69.4%), worked at academic medical centers (60.7%), and had experience of 5 years or less as program directors (42.6%) (for demographic characteristics, see the Supplementary Appendix, available with the full text of this article at NEJM.org). The response rate was highest in pediatrics (83.4%), followed by internal medicine (75.7%) and surgery (65.3%).

Unlike residents, the plurality of program directors (46.7%) expressed overall approval of the requirements. With the exception of duty-period limits, nearly all individual components of the 2011 duty-hours regulations were supported by a large majority (see Table 1). Less than half the program directors (48.0%) supported restricting senior residents' shifts to 24 hours, and an overwhelming majority (71.6%) did not approve of the 16-hour shift limit for interns.

Program directors reported that many aspects of training and patient care have been unchanged by the 2011 regulations, including resident supervision (62.0%), patient safety (57.0%), balance of service and education (60.9%), scores on in-service exams (73.6%), and fatigue (54.4%) (see Table 2). Perceived quality of life for residents was the sole area identified by a plurality of respondents (49.5%) as having improved. Meanwhile, a negative effect was reported for resident education (64.8%), preparedness for senior roles (73.2%), and "ownership" of patients (78.6%);

Table 2. Perceived Effects of 2011 ACGME Regulations.*

Variable	Worse or Decreased	Unchanged	Improved or Increased
		% of respondents (99% CI)	
Patient safety	36.2 (33.4–41.5)	57.0 (51.5–62.4)	6.8 (4.0–9.6)
Quality of patient care	45.8 (43.1–51.2)	48.2 (42.7–53.7)	6.1 (3.4–8.7)
Resident quality of life	17.6 (12.1–21.8)	32.8 (27.7–38.0)	49.5 (44.0–55.0)
Resident fatigue	9.9 (4.6–13.2)	54.4 (48.9–59.9)	35.7 (30.4–41.0)
Education vs. service balance	25.0 (21.1–29.7)	60.9 (55.6–66.3)	14.1 (10.3–18.0)
Resident board or in-service scores	22.0 (19.7–26.6)	73.6 (68.7–78.4)	4.4 (2.2–6.7)
Resident education	64.8 (61.8–70.1)	26.7 (21.9–31.6)	8.4 (5.4–11.5)
Resident preparation for more senior roles	73.2 (71.7–78.0)	25.0 (20.2–29.8)	1.8 (0.4–3.3)
Resident "ownership" of patients	78.6 (76.9–83.1)	19.0 (14.7–23.4)	2.4 (0.7–4.1)
Continuity of care	82.0 (79.7–86.2)	13.6 (9.8–17.4)	4.4 (2.2–6.7)
No. of patients seen or operative cases	47.6 (45.6–53.1)	48.7 (43.2–54.2)	3.7 (1.6–5.7)
Supervision of residents	5.1 (0.0–7.5)	62.0 (56.7–67.4)	32.8 (27.7–38.0)
Frequency of handoffs or sign-out	2.4 (0.0–4.0)	9.7 (6.4–12.9)	88.0 (84.4–91.5)
Program-director workload	0.5 (0.0–1.4)	25.6 (20.8–30.4)	73.8 (69.0–78.6)
Physician-extender (NP or PA) coverage	0.2 (0.0–0.7)	38.4 (33.0–43.7)	61.4 (56.1–66.8)

* Program directors provided responses to the question, "How have the following been affected by the new ACGME regulations?" The differences between proportions are significant if the 99% confidence intervals do not overlap. NP denotes nurse practitioner, and PA physician assistant.

respondents also noted diminished continuity of care (82.0%) and increased frequency of handoffs (88.0%). Most program directors reported an increase in their own workload (73.8%), as well as increased utilization of physician extenders, such as nurse practitioners and physician assistants (61.4%). Finally, less than half the program directors (42.7%) reported that their residents are "always" compliant with duty-hour regulations.

Perhaps our most important finding is the strongly negative response to the 16-hour shift limitation for first-year residents, which mirrors that of earlier surveys.[2-4] As the most junior physicians in the hospital, interns may be the most susceptible to fatigue and errors due to inexperience. Yet residents and program directors do not report that interns are less fatigued or working fewer total hours.[4]

There were some differences of opinion among various demographic groups and specialties. For example, male respondents were more likely than female respondents to report overall disapproval of the regulations (28.2% vs. 18.5%, P<0.01), although there were no meaningful differences between the sexes in specific perceived effects of the regulations. Program directors in academic centers reported greater disapproval and more perceived negative effects than did those at community-based centers. A similar but less dramatic trend was noted among program directors with greater seniority. Finally, there were significant differences among specialties. For example, as compared with other program directors, surgeons were 2.9 times as likely to report the belief that patient safety is worse (P<0.01) and pediatricians were 6.5 times as likely to report a decline in quality of life for residents (P<0.01).

Whereas most program directors approved of nearly all individual duty-hours standards, less than half expressed overall approval of the 2011 Common Program Requirements. This discrepancy may be due to the perceived negative effects on residents' education and accountability ("ownership" of patients) and perhaps also due to the increased workload the requirements have produced for program directors. Alternatively, the strong negative response to daily shift limitations, particularly the 16-hour

limit for interns, may outweigh the positive response to the other standards, swaying overall sentiment. Finally, program directors may simply believe that there are too many regulations, an opinion expressed by 68.3% of respondents.

Although the ACGME remains committed to self-regulation of residency working conditions,[5] our findings highlight the problem of applying a common standard to more than 100,000 resident physicians in the United States. Residents and program directors responding to national surveys since the implementation of the 2011 requirements report that the standards have had a substantial effect on the quality of residency training and residents' preparation to take on more advanced, supervisory roles. They agree that transitions of care have increased while continuity of care has decreased and that there has been no improvement in patient safety or the quality of care provided in U.S. teaching hospitals. Specialty-specific responses, however, suggest that there are fundamental differences in training expectations among disciplines, the most important of which are manifest in the transition from junior to senior resident.

We believe that individual residency-review committees should develop rules to ensure that graduated responsibility is afforded in a safe and specialty-specific manner, while improving residents' education and quality of life as well as patient care. We also think it would be helpful to survey residents and program directors regularly to assess the effects of ACGME regulations on educational experience, achievement of milestones, competency for independent practice at graduation, life of trainees, and effects on patient care. More detailed study of the effects of fatigue and work hours on patient outcomes, "near misses," and medical errors is also warranted. The results of these studies should be considered in future revisions of the Common Program Requirements and in the implementation of the Next Accreditation System.

Disclosure forms provided by the authors are available with the full text of this article at NEJM.org.

From the Departments of Plastic Surgery (B.C.D.), Surgery (M.T.K.), and Medicine (S.A.F.), Rhode Island Hospital; and the Warren Alpert Medical School of Brown University (B.C.D., M.T.K., S.A.F.) — both in Providence.

1. Nasca TJ. Letter to the community. Chicago: Accreditation Council for Graduate Medical Education, 2010.
2. Antiel RM, Thompson SM, Reed DA, et al. ACGME duty-hour recommendations — a national survey of residency program directors. N Engl J Med 2010;363(8):e12.
3. Drolet BC, Spalluto LB, Fischer SA. Residents' perspectives on ACGME regulation of supervision and duty hours — a national survey. N Engl J Med 2010;363(23):e34.
4. Drolet BC, Christopher DA, Fischer SA. Residents' response to duty-hour regulations — a follow-up national survey. N Engl J Med 2012;366(24):e35.
5. Nasca TJ, Philibert I, Brigham T, Flynn TC. The next GME accreditation system — rationale and benefits. N Engl J Med 2012;366:1051-6.
DOI: 10.1056/NEJMp1214483