Approval and Perceived Impact of Duty Hour Regulations: Survey of Pediatric Program Directors

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KEY WORDS
duty hours, education, patient safety, residency training, quality of life, compliance

ABBREVIATIONS
ACGME—Accreditation Council for Graduate Medical Education
OR—odds ratio
PD—program director
PGY—postgraduate year

Dr Drolet conceptualized and designed the study, carried out data collection, interpretation, and analysis, reviewed and revised the manuscript, had full access to all data in the study; and takes responsibility for the integrity of the data and the accuracy of the data analysis. Dr Whittle carried out initial data analysis, drafted the initial manuscript, and coordinated review and revision of the manuscript; Dr Khokhar conceptualized and designed the study, carried out data collection, interpretation, and analysis, and reviewed and revised the manuscript; Dr Fischer conceptualized and designed the study and the survey instrument and critically reviewed the manuscript; Dr Pallant was involved in data analysis and drafting, review, and revision of the manuscript; and all authors approved the final manuscript as submitted.

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WHAT’S KNOWN ON THIS SUBJECT: Several studies have been published evaluating the impact of 2011 Accreditation Council for Graduate Medical Education duty hour regulations. Although resident quality of life may be improved, it appears that resident education and patient care may be worse.

WHAT THIS STUDY ADDS: This is the first study to evaluate pediatric program director approval of 2011 Accreditation Council for Graduate Medical Education Common Program Requirements and the perceived impact of the regulations on patient care, resident education, and quality of life.

OBJECTIVES: To determine pediatric program director (PD) approval and perception of changes to resident training and patient care resulting from 2011 Accreditation Council for Graduate Medical Education (ACGME) Common Program Requirements.

METHODS: All US pediatric PDs (n = 181) were identified from the ACGME. Functional e-mail addresses were identified for 164 (90.6%). Three individualized e-mail requests were sent to each PD to complete an anonymous 32-question Web-based survey.

RESULTS: A total of 151 responses were obtained (83.4%). Pediatrics PDs reported approval for nearly all of the 2011 ACGME duty hour regulations except for 16-hour intern shift limits (72.2% disapprove). Regarding the perceived impact of the new standards, many areas were reportedly unchanged, but most PDs reported negative effects on resident education (74.7%), preparation for senior roles (79.9%), resident ownership of patients (76.8%), and continuity of care (78.8%). There was a reported increase in PD workload (67.6%) and use of physician extenders (62.7%). Finally, only 48.3% of PDs reported that their residents are “always” compliant with 2011 requirements.

CONCLUSIONS: Pediatric PDs think there have been numerous negative consequences of the 2011 Common Program Requirements. These include declines in resident education and preparation to take on more senior roles, as well as diminished resident accountability and continuity of care. Although they support individual aspects of duty hour regulation, almost three-quarters of pediatric PDs say there should be fewer regulations. The opinions expressed by PDs in this study should prompt research using quantitative metrics to assess the true impact of duty hour regulations. Pediatrics 2013;132:819–824.

abstract

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The Accreditation Council for Graduate Medical Education (ACGME) charges residency program directors (PDs) with the responsibility to “implement changes based on the current accreditation standards.”1 These standards are described in the ACGME Common Program Requirements, which also provide guidelines for resident duty hours and supervision. The first national duty hour regulations were enacted by the ACGME in 2003, establishing limits of an 80-hour work week and 30-hour shifts, as well as a minimum 1 day off in 7 for all residents averaged over a 4-week period.

After implementation of the 2003 duty hour regulations, numerous studies were conducted to evaluate their impact. Although several studies suggested that resident quality of life and burnout had improved,2–5 others failed to demonstrate that changes in duty hours had improved resident sleep or patient safety.6–7 Ultimately, no consensus was established in the literature on the effect of regulations on residency education or patient safety.

In 2011, additional limits were established in response to Institute of Medicine recommendations and public pressure, including calls for the Occupational Safety and Health Administration to intervene.8,9 Under the new guidelines, maximum consecutive work hours were restricted to 16 hours for interns (PGY1 residents) and to 24 hours for all other residents. Additionally, the new regulations required onsite supervision for interns at all times.10 The goals of the new Common Program Requirements were to improve resident education, increase the safety and quality of patient care, and improve resident quality of life and well-being through “provision of a safe and humanistic educational environment.”11

When the revised Common Program Requirements were proposed in 2010, PDs and residents voiced concern that additional limitation of work hours would not accomplish the proposed goals.12–18 In 3-year residency programs such as pediatrics with broad training requirements (inpatient and outpatient neonate to adolescent) there was particular concern that residents would lose educational opportunities in favor of service obligations and that training might be need to be lengthened.17–19 Some critics of the proposal thought that the 2003 regulations should be more strictly enforced before work hours were limited further because a number of studies after the initial ACGME regulations demonstrated noncompliance.20–23 Finally, others criticized the distinction made between interns and more senior residents and the potential impact of delaying resident maturation in the developmental pathway of graduate medical education.19

As those primarily responsible for resident education, PDs might be pressured to impose regulations that they believe negatively affect their primary role as educators. To assess perceptions of the 2011 regulations 1 year after their implementation, a national survey of residency PDs in pediatrics, general surgery, and internal medicine was conducted.24

METHODS

A 32-question survey was developed from key duty hours and supervision requirements in the 2011 ACGME regulations and from studies previously conducted by the authors.12,25 The survey was designed to assess PD perceptions of the first year of training under the new duty hour standards. In addition to demographic data, questions about the perceived effect of duty hour limitations on patient care, supervision, resident quality of life, and education were assessed, as was estimated resident compliance with the new rules. The institutional review board of Rhode Island Hospital approved the study. All PDs of ACGME-accredited pediatric, internal medicine, and general surgery residency programs in the United States and its territories were eligible to participate in the study. This study was conducted on these 3 large training groups to allow analysis of differences between the various specialties. A total of 181 pediatric PDs were identified from the ACGME online database, and an extensive Internet search was performed to obtain individual contact information. Functional e-mail addresses were identified for 164 (90.6%) PDs. Beginning in June 2012, 3 individualized e-mails were sent over the course of 6 weeks requesting participation in the anonymous electronic survey.

PDs were asked to indicate approval of 7 individual duty hour rules and their overall impression of the Common Program Requirements. They were then asked to provide positive, neutral, or negative responses about the perceived impact of the ACGME standards. Finally, they were asked to estimate their residents’ compliance with duty hours using a 5-point Likert scale, with an estimate of percentage compliance for standardized reporting. For data analysis, noncompliance was considered any response that did not indicate “always” compliant. Two-sided 95% confidence intervals were calculated by using SE of proportions. Results from pediatric PDs were compared against responses from residency directors in general surgery and internal medicine. In the comparison of responses from different demographic groups, the χ² test was used to test for independence between proportions.

RESULTS

Responses were obtained from 151 of the pediatric PDs who received the
survey (83.4% response rate). There was a nearly equal distribution of male (46.8%) and female (50.0%) respondents. The majority of respondents (61.7%) were between 41 and 60 years old, with nearly half (47.4%) reporting 0 to 5 years of experience as a PD. Of the participating programs, 40.9% ranged from 30 to 49 residents, and 74.0% were affiliated primarily with an academic medical center (Table 1).

**Approval**

Most PDs reported approval for all individual aspects of the Common Program Requirements, with the exception of 16-hour duty periods (72.2% disapproval) (Table 2). Despite approval for most components, when asked about their overall impression, less than half (49.0%) reported “overall” approval of duty hour regulations.

Some differences were noted between specialties, with pediatric program directors more than twice as likely to report approval of direct PGY1 supervision (odds ratio [OR] 2.27, \( P < .01 \)) and a required 8 hours off between shifts (OR 2.42, \( P < .01 \)) than surgical and internal medicine program directors.24 Within the pediatric subset, no significant differences were found based on gender, years as a program director, and program affiliation or size.

**Impact**

Few PDs reported perceived improvements in patient care or resident experiences as a result of the 2011 Common Program Requirements (Table 3). Areas thought to be unchanged included patient safety (68.5%), quality of patient care (52.7%), supervision of residents (65.6%), education versus service balance (53.8%), and resident in-service and board scores (72.1%). Although the majority of respondents (56.0%) reported resident fatigue as unchanged, pediatric PDs were significantly more likely to report worsened fatigue (OR 4.94, \( P < .01 \)) than the other PDs surveyed. Similarly, pediatric PDs were much more likely to report worsened resident quality of life than colleagues in general surgery or internal medicine (OR 6.54, \( P < .01 \)).

Beyond factors that were reportedly unchanged, PDs noted many negative consequences, including worsened resident education (74.7%), preparation for more senior roles (79.9%), ownership of patients (76.8%), and continuity of care (78.8%). Nearly 90% reported an increased frequency of patient care handoffs. Although many respondents reported that the number of patients seen by residents has not changed (48.7%), nearly as many (46.0%) reported that patient encounters have decreased. Many PDs also reported an increase in their own workload (65.6%) and more coverage by physician extenders (62.7%). Pediatric PDs were more likely than their peers in surgery and medicine to report worsened education (OR 1.85, \( P < .01 \)) and preparation for senior roles (OR 1.67, \( P < .01 \)).

**Compliance**

Finally, resident adherence to Common Program Requirements was reportedly low, with only 48.3% of PDs reporting that their residents are “always” compliant. When pediatric residents were asked this same question in an earlier study, only 42.2% of respondents reported that they were always compliant.26 Pediatric PDs were somewhat more likely to report compliance than those in surgery or internal medicine (OR 1.40, \( P = .01 \)). No other significant differences were noted in the subgroup analyses.

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**TABLE 1** Demographics of Respondents, \( N \) (% of sample)

<table>
<thead>
<tr>
<th>Gender</th>
<th>( N ) (% of sample)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>72 (47.68%)</td>
</tr>
<tr>
<td>Female</td>
<td>77 (50.98%)</td>
</tr>
<tr>
<td>Not reported</td>
<td>5 (1.32%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Age</th>
<th>( N ) (% of sample)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;40</td>
<td>38 (25.17%)</td>
</tr>
<tr>
<td>41–60</td>
<td>95 (62.91%)</td>
</tr>
<tr>
<td>&gt;60</td>
<td>17 (11.28%)</td>
</tr>
<tr>
<td>Not reported</td>
<td>1 (0.68%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Years as PD</th>
<th>( N ) (% of sample)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0–5</td>
<td>73 (48.34%)</td>
</tr>
<tr>
<td>6–10</td>
<td>39 (25.83%)</td>
</tr>
<tr>
<td>11–15</td>
<td>18 (11.92%)</td>
</tr>
<tr>
<td>16–20</td>
<td>10 (6.62%)</td>
</tr>
<tr>
<td>&gt;20</td>
<td>10 (6.62%)</td>
</tr>
<tr>
<td>Not reported</td>
<td>1 (0.68%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Program Size (% of residents)</th>
<th>( N ) (% of sample)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1–29</td>
<td>36 (23.84%)</td>
</tr>
<tr>
<td>30–49</td>
<td>63 (41.72%)</td>
</tr>
<tr>
<td>50–79</td>
<td>27 (17.88%)</td>
</tr>
<tr>
<td>&gt;80</td>
<td>24 (15.89%)</td>
</tr>
<tr>
<td>Not reported</td>
<td>1 (0.68%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Primary Program Affiliation</th>
<th>( N ) (% of sample)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Academic medical center</td>
<td>114 (74.50%)</td>
</tr>
<tr>
<td>Community-based</td>
<td>32 (21.19%)</td>
</tr>
<tr>
<td>Veterans or military</td>
<td>5 (3.31%)</td>
</tr>
<tr>
<td>Not reported</td>
<td>1 (0.00%)</td>
</tr>
</tbody>
</table>

**TABLE 2** PD Approval of Components of the 2011 Common Program Requirements (Question: “Regarding the ACGME Common Program Requirements, please indicate your level of approval.”)

<table>
<thead>
<tr>
<th>Component</th>
<th>Disapprove</th>
<th>Neutral</th>
<th>Approve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct supervision of PGY1</td>
<td>2.7% (0.1–5.2)</td>
<td>11.3% (9.3–16.4)</td>
<td>86.0%* (80.5–91.5)</td>
</tr>
<tr>
<td>80 h work week</td>
<td>5.3% (1.7–8.9)</td>
<td>14.6% (8.9–20.2)</td>
<td>80.1%* (73.8–86.5)</td>
</tr>
<tr>
<td>1 d off in 7</td>
<td>1.3% (0.0–3.1)</td>
<td>7.9% (3.6–12.3)</td>
<td>90.7%* (86.1–95.4)</td>
</tr>
<tr>
<td>16 h PGY1 shifts</td>
<td>72.2%* (65.0–79.3)</td>
<td>15.2% (9.5–21.0)</td>
<td>12.6% (7.3–17.9)</td>
</tr>
<tr>
<td>24+4 h senior resident shifts</td>
<td>21.2% (14.7–27.7)</td>
<td>25.2% (18.2–32.1)</td>
<td>53.6%* (45.7–61.6)</td>
</tr>
<tr>
<td>8 h off between shifts</td>
<td>5.3% (1.7–8.9)</td>
<td>12.6% (7.3–17.9)</td>
<td>82.1%* (78.0–88.2)</td>
</tr>
<tr>
<td>Night shift frequency (&lt;7 consecutive days)</td>
<td>14.0% (8.5–19.5)</td>
<td>14.7% (9.0–20.3)</td>
<td>71.3%* (64.1–78.5)</td>
</tr>
<tr>
<td>Overall impression</td>
<td>21.1% (14.6–27.6)</td>
<td>29.9% (22.6–37.2)</td>
<td>49.0%* (41.0–57.0)</td>
</tr>
</tbody>
</table>

* Indicates significant difference by nonoverlapping 95% confidence interval.
DISCUSSION

Three primary objectives were proposed for the 2011 ACGME Common Program Requirements: improved patient safety, quality of resident education, and resident quality of life.11 According to pediatric PDs in this study, patient safety is unchanged and education and quality of life are worse for residents. A similar study of pediatric residents supports these results with concordant responses; the majority of residents reported no change in patient safety, inferior education, and worsened quality of life for senior residents.27 The results from pediatric PDs differed from those in general surgery and internal medicine in several areas, particularly regarding worsened education and resident preparedness for more senior roles. More strict regulation of duty hours is intended to improve quality of life for residents and patient safety, but conditions for education have reportedly worsened in pediatrics. Interns, now allowed to work a maximum of 16 consecutive hours, may admit and see fewer patients through their course of illness and experience less continuity in each patient’s hospital course. Pediatric patients often have significant changes over a 24-hour period, so residents working shifts may not see the evolution of disease processes as they admit patients and sign them out to a new team shortly after admission. Under the new regulations, patients may have 2 or more completely separate teams of doctors caring for them in a 24-hour period, diminishing either team’s ability to follow patients’ progression. Additionally, this may affect the feeling of accountability or “ownership” of a patient and a care plan. Residents may think that they can leave tasks to the day team or night team also caring for the patient, which compromises communication with families, timeliness of appropriate treatment, and the development of critical skills in professionalism and “responsiveness to patient needs that supersedes self-interest.”10 In pediatrics, unlike surgical specialties, supervisory roles are often assigned to PGY2 residents, necessitating a more rapid transition from intern to senior resident. Fewer experiences following the entire course of illness and communicating with families as the primary provider may compromise residents’ ability to make this transition smoothly. Early second-year residents may have a steeper learning curve than before the regulations while also adjusting to working longer shifts. Such negative changes in both education and continuity of care were endorsed by most pediatric PDs in this survey.

Another factor that may contribute to the sense of declining resident education is the amount of time spent on night shifts. Traditionally, didactic teaching conferences occur during daytime hours. After implementation of the 2011 standards, many residency programs have moved to a night float system in which residents may attend fewer daytime educational conferences. Residents may have weeks or months of nights with fewer direct mentorship and formal educational experiences. In some cases there has been a substitution of more passive computer-based...
curriculum for traditional experiential learning. Residency programs will need to track resident competency as current PGY1 residents take on supervisory duties and face their initial experiences of working 24 consecutive hours. Less preparation for senior-level roles may affect both patient care and the role of the attending, who may have to provide more guidance and become more “hands on” than in previous years.28

Regarding patient care, the majority of PDs reported that quality and safety have not improved as a result of 2011 ACGME regulations. In fact, many more program directors reported that safety (26.9% vs. 4.7%) and quality of care (40.5% vs. 6.7%) are worse after the 2011 duty hour regulations were adopted. Although this study did not measure safety outcomes, there are several potential reasons for the perception of a decline in patient care. First, the increase in shift work caused by limited consecutive duty hours leads to fragmentation of care, with more frequent handoffs and decreased continuity. Increasing the number of transfers between providers can create communication errors or omissions, which may lead to adverse outcomes.29 Second, most PDs thought supervision was unchanged. Although supervision has been a concern raised in discussions of work hour limitations for residents, it is possible that the level of supervision was already consistent with the new 2011 requirements before their formal statement by ACGME. Finally, although fatigue mitigation was theorized to improve safety, PDs also reported that residents are generally not getting more rest. In fact, pediatric PDs were nearly 5 times more likely to report worsened fatigue than surgery and internal medicine PDs. Ultimately, none of the Common Program Requirement changes are perceived to have improved the quality and safety of patient care.

A unique finding in this survey is a surprisingly low rate of resident compliance with current duty hour rules, which is supported by data from resident surveys.26,27 Although PDs reported that residents are “mostly” compliant, this does not meet a strict definition of the duty hour rules established by the ACGME, which are core requirements in all programs and a “must,” not a “should.”29 If noncompliance is considered any violation of duty hours, then more than half of residents are reportedly noncompliant. The reasons for noncompliance must be studied to determine whether and where future changes in residency training rules should be made.

Although many surveys are limited by low response rates and small sample sizes, the data from this study represent most PDs from ACGME-accredited pediatric programs. Given the anonymous nature of the survey, social desirability bias is also limited.31 Finally, the simple nature of the survey, with positive, neutral, and negative responses, decreases interpretation or leading of responses, which can be a problem in survey research.

The results demonstrate an interesting paradox in PDs’ attitudes: Despite many negative reported perceptions, more than twice as many PDs reported approval than disapproval of the new Common Program Requirements (49.0% vs. 21.1%). This paradox may be explained by the strongly positive perceptions of the individual components of the regulations, with 80% approval of nearly all areas measured except for shift length restrictions. At the same time, nearly three-quarters of the sample (71.3%) stated that there should be fewer duty hour regulations. Therefore, it seems that although PDs agree with the principle of regulating duty hours, they do not necessarily think that the results of such regulation have been beneficial in practice.

CONCLUSIONS

This is the first published survey of pediatric PDs regarding 2011 ACGME Common Program Requirements. Although many PDs approve of the Common Program Requirements, they think resident education, quality of life, and continuity of patient care have worsened, with no improvements in numerous areas including fatigue, patient safety, and supervision. This postimplementation study identifies a need to better study the effects of the 2011 requirements on pediatric training and the safety of children under the care of residents.

ACKNOWLEDGMENTS

The composite data (internal medicine, general surgery, pediatric PDs) from this research were published as a Perspective Article in the New England Journal of Medicine in February 2013,24 and the pediatric PD data were presented as a poster at the 2013 Association of Pediatric Program Directors meeting in Nashville, TN.32

REFERENCES


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/content/132/5/819.full.html