

Persistent Noncompliance With the Work-Hour Regulation

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Objective: To investigate the reason for noncompliance with the work-hour regulation by surgical residents.

Design: Nationwide anonymous survey (November 1, 2007, to March 1, 2008).

Setting: Academic center.

Participants: Surgical residents throughout the United States.

Main Outcome Measures: Incidence of noncompliance remains high and reasons for noncompliance are multifactorial.

Results: The first 141 questionnaires returned were included in this analysis. Responders consisted of postgraduate year (PGY)-1 (32.6%), PGY-2 (19.1%), PGY-3 (17.7%), PGY-4 (13.5%), and PGY-5 (17.0%) surgical residents. Many residents were categorical (79.4%), male (61.7%), and married (53.2%). Ninety-eight percent of residents were aware of the work-hour regulation, with

72.1% of residents in favor of it. However, noncompliance with the work-hour regulation was 64.6%, with 21.1% of residents working more than 90 h/wk (average, 86.6 h/wk). The most problematic regulations to follow were "at least 10 hours of rest between duty hours" (36.9%), "24-hour limit of continuous care plus 6 additional hours for continuity of care and educational objectives" (26.1%), and "80-hour work limit over 4 weeks" (22.7%). Education and continuity in patient care were the main reasons associated with noncompliance. Noncompliance was highest in trauma (25.2%) and vascular surgery (16.3%) residents. In addition, 65.2% of the attending physicians do not agree with implementing work-hour regulation standards in the surgical faculty.

Conclusions: The survey demonstrates that noncompliance with the work-hour regulation is prevalent. The reasons for noncompliance are multifactorial. These findings will help restructure training programs in the efforts to increase compliance with the work-hour regulation.

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THE MODERN AMERICAN SURGICAL residency in the early 20th century established by Halsted has undergone a fundamental shift since Libby Zion's case in 1984.¹⁻³ It has led to the formation of the Ad Hoc Advisory Committee on Emergency Services, more commonly known as the 405 (Bell) Regulations.^{2,4,5} The major reasons behind these changes were patient safety, resident well-being, and resident education.^{3,6,7}

On July 1, 2003, requirements approved by the Accreditation Council for Graduate Medical Education (ACGME) were implemented nationwide.⁸ These guidelines include (1) a limit of 80 hours of work per week over 4 weeks, (2) at least 10 hours of rest between duty periods, (3) a 24-hour limit of continuous care plus 6 additional hours of education and continued care, (4) an average of 1 day in 7 days that is free from patient care and educa-

tional obligations over 4 weeks, and (5) an average of in-house call no more than once every 3 nights over 4 weeks.⁹ Compliance has improved during the past 8 years; however, violations are still documented.^{10,11} As evidenced by the numerous articles published since approval of the requirements, this topic remains a dilemma.

This study addressed the reasons for noncompliance among surgical residents and documented the effects of the work-hour regulation on the surgical faculty.

METHODS

We designed a questionnaire subdivided in 16 structured categories (November 1, 2007, to March 1, 2008). General surgery residents from 74 nationwide academic programs were surveyed, and responses were anonymous. The program directors of each institution were contacted and all agreed to participate. The of-

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Table 1. Sample Characteristics of the 141 Responding Surgical Residents

Characteristic	No. (%)
Clinical PGY (n=141)	
1	46 (32.6)
2	27 (19.1)
3	25 (17.7)
4	19 (13.5)
5	24 (17.0)
Training track (n=141)	
Categorical	112 (79.4)
Preliminary	29 (20.6)
Sex (n=141)	
Male	87 (61.7)
Female	54 (38.3)
Marital status (n=141)	
Single	66 (46.8)
Married	75 (53.2)
Divorced	0
Have children (n=139)	
Yes	32 (23.0)
No	107 (77.0)
Primary hospital type (n=141)	
Academic center	141 (100.0)
Community hospital	0
Current work hours/week (n=127)	
Average hours/week (86.6)	
<80	37 (29.1)
80-89	63 (49.6)
90-99	19 (15.0)
≥100	8 (6.3)

Abbreviation: PGY, postgraduate year.

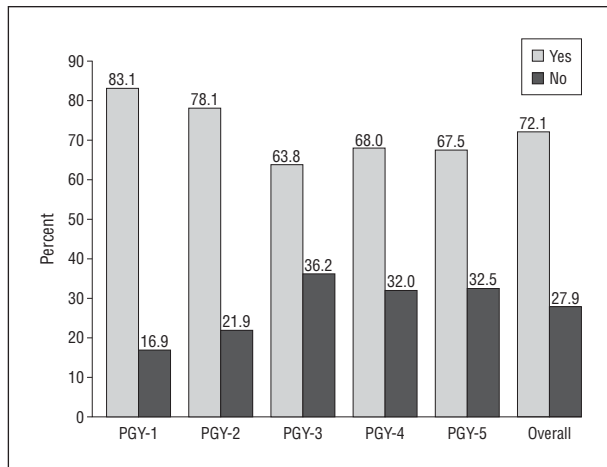


Figure 1. Percentage of 141 surgical residents who agree or disagree with the 80-hour work week restriction according to postgraduate year (PGY) level.

fices of each institution distributed the survey to their residents (N=1258).

The participants were required to provide information about their residency status, their most common cause of noncompliance, rotations in which they are having difficulty meeting the restrictions, and general knowledge of the work-hour regulation.

To perceive the effects of the work-hour regulation on the surgical faculty, a structured 5-category anonymous questionnaire was distributed to the surgical faculty (N=106) at the Mount Sinai Medical Center in New York.

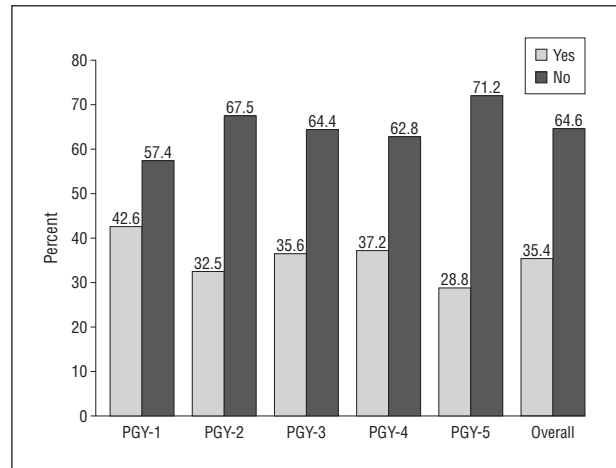


Figure 2. Percentage of 141 surgical residents who remain compliant with the 80-hour work week restriction. PGY indicates postgraduate year.

Most attitudinal questions were formatted as 5-point Likert scales. The χ^2 test was used for result analysis and validation.

Institutional review board approval was obtained for this study.

RESULTS

The first 141 questionnaires returned were included in this study and reviewed. Most responses were submitted by surgical residents in New York (23.4%), Illinois (14.2%), and Minnesota (13.3%). Respondents consisted of postgraduate year (PGY)–1 (32.6%), PGY-2 (19.1%), PGY-3 (17.7%), PGY-4 (13.5%), and PGY-5 (17.0%) residents. Many residents were categorical (79.4%), male (61.7%), and married (53.2%). Residents reported working an average of 86.6 h/wk. The sample characteristics are outlined in **Table 1**.

Ninety-eight percent of residents were aware of the work-hour regulation, with 72.1% of residents in favor of it (**Figure 1**). The restrictions provided by the ACGME were perceived as fair by 68.1% of the respondents and compliance was considered important by 85.7%. However, noncompliance with the work-hour regulation was highest among PGY-5 residents, at 71.2% (**Figure 2**). Twenty-one percent of residents reported working more than 90 h/wk.

The regulations that residents found most difficult to remain compliant with were “at least 10 hours of rest between duty hours” (36.9%), “24-hour limit of continuous care plus 6 additional hours for continuity of care and educational objectives” (26.1%), and “80-hour work limit over 4 weeks” (22.7%). As outlined in **Table 2**, education and continuity in patient care were the main reasons associated with noncompliance. Lack of ancillary staff, although not the predominant reason for noncompliance, was of concern by 39.4% of the respondents. Fifty-eight percent of the respondents did not consider fear of the program director or residency program as a factor for remaining compliant. Senior personnel were not the cause of noncompliance according to 69.0% of the residents. Work hours were most frequently violated on the trauma (25.2%), vascular (16.3%), and general surgery (14.1%) services.

Table 2. Survey Response Among Surgical Residents Regarding Cause of Noncompliance

Cause	%				
	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Involvement in long or emergency case(s)	45.4	27.7	12.8	12.1	2.1
Think you may miss something (interesting case) that will arise after you leave	17.7	22.7	17.0	32.6	9.9
Interest in work and taking care of patients	32.6	36.9	17.0	11.3	2.1
Late ward rounds	25.5	27.7	13.5	21.3	12.1
To leave a good impression on your seniors/attendings	12.8	31.2	24.8	24.8	6.4
Too busy with other responsibilities	22.0	30.5	22.0	21.3	4.3
Peer pressure	7.8	17.0	27.0	31.9	16.3
Feel guilty when leaving the hospital	13.5	28.4	26.2	22.7	9.2
Must stay late for teaching or conferences	7.8	22.0	20.6	32.6	17.0
Were told to stay late	9.2	16.3	16.3	26.2	31.9
To hang out with coresidents	1.4	11.3	25.5	37.6	24.1
Lack of ancillary hospital staff	17.0	22.0	13.5	32.6	14.9

In addition, we investigated the effects of the work-hour regulation on the surgical faculty at our institution. Fifty-four questionnaires were returned and reviewed, yielding a response rate of 50.9%. Fifteen surgical specialties were addressed; the most common were general surgery (21.2%), laparoscopic surgery (13.4%), colorectal surgery (13.2%), and vascular surgery (13.1%). The lengths of time employed as an attending physician were less than 1 year (8.2%), 1 to 5 years (21.5%), 5 to 10 years (26.2%), 10 to 20 years (22.1%), and more than 20 years (22.0%). Thirty-five percent of the attending physicians did not agree with the current work-hour regulation. Many (65.2%) did not agree with implementing work-hour regulations in the surgical faculty (**Figure 3**).

COMMENT

The impact of the work-hour regulations mandated by the ACGME has created concern.¹²⁻¹⁵ Our survey shows that noncompliance with the work-hour regulation is prevalent. Quality of surgical education, as well as continuity in patient care, were the major factors contributing to the high rate of noncompliance among surgical residents.

Although compliance was perceived to be important (85.7%), 70.7% of surgical residents work more than the 80 h/wk maximum proposed by the ACGME. These findings were highest among PGY-5 residents and show that significant schedule changes must be implemented to comply with the new regulations.

Violations were highest among PGY-5 residents (71.2%). The regulation that residents found most difficult to remain compliant with was getting at least 10 hours of rest between duty hours (36.9%). While the concept of work-hour restrictions is supported by most residents (72.1%), noncompliance remains high. Concern about reduced exposure to challenging clinical problems and operative cases, as well as a sense of responsibility to the patients/work, remains problematic. In addition, 35.2% of the surgical faculty believe that decreasing work hours would be detrimental to residents' education. In our opinion, ensuring operative volume, minimizing tasks that serve no educational or clinical value, encouraging operative

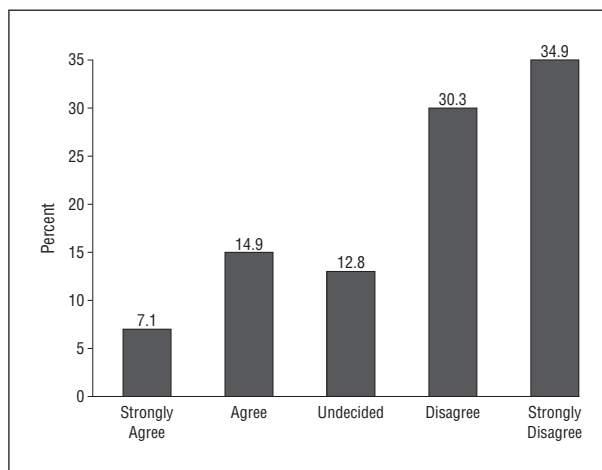


Figure 3. Perceived attitudes on introducing the work-hour regulations for 54 attending physicians.

simulator-based systems, implementing standardized or computerized “sign-outs,” and multiple levels of redundancy in patient care should be considered to ensure a higher quality surgical education.

Noncompliance was highest in trauma (25.2%), vascular surgery (16.3%), and general surgery (14.1%) services. Recognizing the affected specialty and increasing house-staff members in particular rotations should be considered as a possible solution.

The concept of introducing work-hour regulations among surgical faculty was opposed by 65.2% of the respondents. The faculty was less supportive of such restrictions as the length of employment increased. This may be explained by a more traditional mentality and resistance to change among senior surgical staff.

CONCLUSIONS

The survey demonstrates that noncompliance with the work-hour regulation remains high and the reasons are multifactorial. These findings will help restructure training programs in the efforts to increase compliance with the work-hour regulation. The effect of future

duty-hour restrictions among surgical residents and faculty remains a dilemma.

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