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Physician Practice Patterns Resemble ACGME Duty Hours

Mamle Anim, MD,^a Ronald J. Markert, PhD,^{a,b} Virginia C. Wood, MD,^a Barbara L. Schuster, MD^a

^aDepartment of Internal Medicine and ^bDepartment of Orthopedics, Wright State University Boonshoft School of Medicine, Dayton, Ohio.

Since July 2003, all residency and fellowship programs in the United States have adapted to and developed innovative ways to comply with the Accreditation Council for Graduate Medical Education (ACGME) duty hours regulation for physicians-in-training. ACGME introduced these standards in response to increased patient acuity and research showing that sleep deprivation may have negative effects on clinical and educational performance. In addition to education, other concerns contributing to the need for the new duty hours regulation were patient safety and physician fatigue and well-being.¹ A 1999 Institute of Medicine report urged an investigation of the relationship between duty hours and medical fatigue, alertness, and sleep deprivation.² ACGME defines duty hours as all clinical and academic activities related to the training program—that is, patient care (both inpatient and outpatient), administrative duties related to patient care, provision for transfer of patient care, time spent in-house during call activities, and scheduled activities such as conferences. Duty hours do not include reading and preparation time spent away from the work site.

ACGME defined 6 duty hours regulations.³ Duty hours must:

1. Be limited to 80 hours per week, averaged over a 4-week period, inclusive of all in-house call activities.
2. Consist of continuous onsite duty, including in-house call, not exceeding 24 consecutive hours. Residents may remain onsite for up to 6 additional hours to participate in didactic activities, transfer patient care, conduct outpatient clinics, and maintain continuity of medical and surgical care.
3. Provide adequate time for rest and personal activities, consisting of a 10-hour period after daily duties and following in-house call.
4. Allow residents 1 day in 7 free from all educational and clinical responsibilities, averaged over a 4-week period, inclusive of call.
5. Ensure in-house call occurs no more frequently than every third night.
6. Ensure at-home call must not be so frequent as to preclude rest and reasonable personal time for each resident. When residents are called into the hospital from home, the hours residents spend in-house are counted toward the 80-hour limit.

We will refer to these first 4 standards as the 80-hour rule, the 30-hour rule, the 10-hour rule, and the 4-days-off-per-month rule, respectively. Osteopathic residency duty hours regulation parallel ACGME, with the exception of requiring a 12-hour period off upon conclusion of a 24-hour duty shift.⁴

Since the inception of the duty hours regulation, some residency program directors and others involved in graduate medical education have remained ambivalent about the regulations. Some critics purport that the

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Requests for reprints should be addressed to Mamle Anim, MD, Department of Internal Medicine, Wright State University Boonshoft School of Medicine, 3535 Salem Avenue, Dayton, OH 45406.

E-mail address: mamle.anim@wright.edu

rules interfere with education, the development of professionalism, and continuity of care.⁵⁻⁸ Other supporters have touted positive effects, including reduction in medical errors, enhancement of education, improved quality of life, and a sense of clinical preparedness.⁸⁻¹¹

Few studies have investigated the current work hours of practicing physicians and how closely they resemble the ACGME duty hours regulation.¹²⁻¹⁴ In 2003, the American Medical Association (AMA) House of Delegates agreed to support participation in efforts to monitor the impact of resident duty hours regulation on postresidency physicians. The results of this effort are not yet available.

Our survey research study had 2 purposes: determine the knowledge of practicing physicians regarding 4 of the ACGME duty hours regulation standards, and discover if practicing physician work hours resemble the ACGME mandated hours for residents and fellows. We hypothesized that physicians in practice routinely work hours that are beyond the limits for physicians-in-training. We also hypothesized that physician work hours would differ by time since completion of residency and by type of practice.

METHODS

We surveyed physicians practicing in the Dayton, Ohio metropolitan area about their specialty, type of practice, years since residency graduation, knowledge of ACGME duty hours regulation, and their personal work hours. Dayton, the largest city in Montgomery County, and its suburbs had a population of nearly 850,000 in 2005.¹⁵ Health care entities within the Dayton metropolitan area administer 17 allopathic residency and 4 allopathic fellowship programs, and 17 osteopathic residency and 4 osteopathic fellowship programs. Approximately 550 residents and fellows train in Dayton.¹⁶ The allopathic programs are either directly sponsored by or affiliated with Wright State University Boonshoft School of Medicine, and the osteopathic programs are sponsored by Grandview Hospital, affiliated with Ohio University College of Osteopathic Medicine. Most practicing physicians in the Dayton area have contact with residents and fellows on a frequent or occasional basis.

In December 2006, we obtained survey approval from the Wright State University Institutional Review

Board. The survey questionnaire consisted of 5 components and required 5-10 minutes to complete. Surveys were mailed to both allopathic and osteopathic physicians who were active members of the Montgomery County Medical Society or active medical staff

members at Good Samaritan Hospital or Miami Valley Hospital. The physician lists from the 3 sources were reconciled to avoid duplicate mailings. Approximately 93% of individuals surveyed were allopathic physicians. More than 1300 surveys (n = 1311) were mailed in February 2007, with a follow-up to non-respondents in March 2007. A cover letter explaining the purpose of the survey and a prepaid return envelope were included in each mailing. An identification number was used for tracking responses and to ensure confidentiality. Data were finalized in May 2007.

Means and standard deviations are reported for continuous data, and frequencies and percents for categorical data. The chi-squared test and Fisher's exact test were

used for group comparisons. Inferences were made at the .05 level of significance, with no correction for multiple comparisons.

RESULTS

We received 570 completed surveys, a response rate of 43.5%. Not all respondents replied to every question; the number of responses per question varied (Table 1). The respondents included primary care physicians (42%), surgeons, including obstetricians/gynecologists (25%), medical subspecialists (14%), and other practitioners (19%). With regard to practice type, 68% belonged to a group practice, 16% were in solo practice, 13% worked in academic medicine, and 3% were categorized as other. The majority of respondents (88%) completed a residency program at least 5 years before the survey.

Sixty-five percent of respondents were aware of the 10-hour rule, 73% were familiar with the 30-hour rule, 84% the 80-hour rule, and 62% the 4-days-off-per-month rule. When asked about their personal work hours, 74% of physicians had a minimum of 10 hours between shifts; 64% limited themselves to a maximum of 30 continuous hours of work. Fifty-seven percent restricted their work to a maximum of 80 hours per week, and 78% took a minimum of 4 days off per month.

PERSPECTIVES VIEWPOINTS

- The majority of physicians in practice understand current Accreditation Council for Graduate Medical Education duty hour regulations for residents.
- Physicians in solo, group, or academic practice tend to work hours in excess of the resident limit of 80 per week, but are more likely to have 10-hour rest periods and 4 days off per month.
- Physicians closer to graduation from residency tend to work hours more in keeping with Accreditation Council for Graduate Medical Education regulation.

Table 1 Survey Results for Categorical Responses

	Number Responding
Type of specialty*	
Primary Care	237 (41.9%)
Surgery	143 (25.1%)
Medical Subspecialties	78 (13.8%)
Other	109 (19.3%)
Total	566
Type of practice	
Group	384 (67.6%)
Solo	93 (16.4)
Academic	72 (12.7%)
Other	19 (3.3%)
Total	568
When did you complete residency?	
≥5 years	500 (88.2%)
<5 years	67 (11.8)
Total	567
Are you aware of the following ACGME work hour rules for residents and fellows? (Number responding "yes"/total number responding)	
A minimum of 10 hours between shifts	362/555 (65.2%)
A maximum of 30 continuous work hours	406/553 (73.4%)
A maximum of 80 hours of work per week	473/561 (84.3%)
A minimum of 4 days off per 30-day period	343/554 (61.9)
In your current practice do you have a: (Number responding "yes"/total number responding)	
Minimum of 10 hours between shifts	404/548 (73.7%)
Maximum of 30 continuous work hours	351/547 (64.2%)
Maximum of 80 work hours per week	314/547 (57.4%)
Minimum of 4 days off per month	430/552 (77.9%)

ACGME = Accreditation Council for Graduate Medical Education. Not all 570 respondents replied every survey item.

*Type of specialty:

Primary care included Family Medicine (n = 107), General Internal Medicine (n = 87), Pediatrics (n = 33), and Medicine/Pediatrics (n = 10); Surgery included General Surgery (n = 26), surgical subspecialties (n = 31), Obstetrics and Gynecology (n = 43), Orthopedics (n = 27), and Ophthalmology (n = 16); Medical subspecialties included Cardiology (n = 25), Gastroenterology (n = 13), Critical Care (n = 11), and 29 in other medical subspecialties; Other included Emergency Medicine (n = 24), Radiology (n = 14), Dermatology (n = 13), Psychiatry (n = 11), Pathology (n = 10), and 37 in other specialties.

Respondents reported a mean of 59.6 hours of work per week, with a mean of 12.5 hours between work days (Table 2). On average, respondents worked a maximum of 20 continuous hours and took an average of 6 days off per month. Written responses were not requested; however, 41 respondents included comments

instead of providing the number of hours worked. All commenters stated that there was no limit to the number of hours they worked, using terms such as "no limit," "work as patients need," and "work until the work is done." One physician stated "when done or unable to function."

Primary care physicians were more likely than their surgery or medical subspecialty colleagues to have practice patterns resembling the ACGME guidelines for the 10-, 30-, and 80-hour rules (Table 3). More so than surgeons and medical sub-specialists, primary care respondents allotted a minimum of 10 hours between workdays, limited their work to a maximum of 30 continuous hours, and restricted their work to a maximum of 80 hours per week.

When the work hours were compared with years since residency completion (Table 4), 86% of physicians who completed their training <5 years ago reported a minimum of 10 hours between work days, as opposed to 72% of physicians completing their training more than 5 years ago ($P = .015$). Compared with earlier graduates, recent graduates more often reported limiting their work to a maximum of 30 continuous hours (76% vs 63%, $P = .031$). There was no significant difference between the 2 groups on the 80-hours-per-week and 4-days-off-per-month rules: 66% versus 56% ($P = .16$) and 82% versus 77% ($P = .38$), respectively.

No differences were found for physicians in group, solo, and academic practices when compared on the 10-, 30-, and 80-hour rules (Table 5). We found a difference in the number of days off per month, with 86% of group practitioners reporting a minimum of 4 days off per month, followed by 69% of academic physicians and 48% of solo practitioners ($P < .001$ for both comparisons: group vs. academic and group vs solo). Also, academic physicians were more likely than physicians in solo practice to take at least 4 days off per month ($P = .007$).

When the interactions between practice type and years since graduation were tested, only 1 of 12 comparisons was significant (ie, among group practice physicians, recent graduates were more likely than earlier graduates to adhere to the 30-hour rule [80% vs 64%, $P = .036$]). Thus, within type of practice subgroups (solo, group, academic), respondents who were <5 years from completing residency were no more likely than individuals who completed residency at least 5 years before the survey to adhere to the 4 ACGME duty hours regulation standards in their personal schedules (Table 6).

DISCUSSION

We found that the majority of physicians in practice were aware of the ACGME duty hours regulation standards for residents. The work hours of a majority of

Table 2 Physician Work Hours/Current Practice

ACGME Rule Adherence by Practicing Physicians	Number of Respondents*	Mean (Hours)	Standard Deviation (Hours)
How many hours do you generally have between work days?	374	12.5	4.8
How many hours of continuous work is your limit?	296	19.9	11.8
How many hours per week do you generally work?	375	59.6	16.6
How many days off do you typically have per month?	406	5.9	3.3

ACGME = Accreditation Council for Graduate Medical Education.

*Not all 570 respondents replied every survey item.

respondents were within the parameters of the ACGME and American Osteopathic Association standards for residents. Even though the 80-hour work week was the best known of the 4 ACGME rules, in our study it was the rule to which practicing physicians were least likely to adhere. In contrast, respondents were least familiar with the 10-hour rule and 4-days-off-per-month rule, but the practice of respondents was most consistent with these 2 ACGME directives.

Physicians in practice for <5 years had work hours more in agreement with physician-in-training duty hours. This concordance may be due to the ACGME standards being in effect during all or part of the training period for younger physicians. The differences in work hours by years in practice also might be attributed to generational differences in approach to work. Younger physicians belong to "Generation X" (born between 1965 and 1980), a group known for placing family and quality of life as equal or greater in importance to work.¹⁷ Thus, while many practicing physicians have shared the opinion that today's residents are not being adequately conditioned for the grueling time demands of postresidency practice, our evidence suggests that young physicians might experience little or no change in work hours as they enter practice.

We found only one significant difference when comparing the 4 work hour rules by type of practice. Solo practitioners (48%) were less likely to take the minimum of 4 days off per month compared with their group practice (86%) and academic (69%) colleagues. Obviously, physicians in solo practice have

less scheduling flexibility and shared patient care. Also, academic physicians, responsible for the supervision of residents, may be less able to adapt their schedule. Academic physicians face requirements governing resident duty hour supervision and government patient care billing regulations. Faculty physicians are often responsible by default for patient care on the "teaching services" to ensure resident compliance with duty hours regulation.¹⁸

Further, work hour differences between the more recently trained physicians and their more experienced colleagues were not sustained (with one exception) when the interaction between type of practice and years since residency was examined. Type of practice may lessen the influence of years since residency on adherence to ACGME duty hours regulation. It is noteworthy that when choosing from among solo, group, or academic settings, 73% (44 of 60) of recent graduates chose group practice.

Although the majority of physicians (57%) reported limiting work hours to 80 per week, more than 40% of all physicians did not. At the same time, physicians reported working an average of approximately 60 hours per week. This apparent inconsistency may be explained by scheduling flexibility and the ability of physicians to vary their work hours while reacting to personal matters and patient care needs. Physicians may sometimes work more than 80 hours a week, but it is not a frequent reported behavior. This same variability may be observed in resident schedules with occasional weeks of more than 80 hours, but notably less on average.

Table 3 Comparison between Primary Care Physicians, Surgeons, and Medical Subspecialists on Adherence to ACGME Resident Work Standards

	Primary Care	Surgeons	Medical Subspecialists
Number with a minimum of 10 hours between shifts*†	182/226 (80.5%)	85/136 (62.5%)	51/77 (66.2%)
Number with a maximum of 30 continuous work hours*†	163/227 (71.8%)	55/136 (40.4%)	38/72 (52.8%)
Number with a maximum of 80 work hours per week*†	145/227 (63.9%)	54/137 (39.4%)	32/73 (43.8%)
Number with a minimum of 4 days off per month	181/231 (78.4%)	97/136 (71.3%)	60/76 (78.9%)

ACGME = Accreditation Council for Graduate Medical Education.

*Primary care > surgeons, $P < .001$ (chi-squared test).

†Primary care > medical specialties, $P \leq .01$ (chi-squared test).

Table 4 ACGME Work Hours Standards: Comparison by Years Since Residency Completion

Question	Respondents <5 Years Since Completion Answering "Yes"/Total in Category	Respondents ≥5 Years Since Residency Completion Answering "Yes"/Total in Category	P Value*
Do you have a minimum of 10 hours between shifts/work days?	56/65 (86.2%)	345/479 (72%)	.015
Do you limit yourself to a maximum of 30 continuous work hours?	51/67 (76.1%)	298/476 (62.6%)	.031
Do you limit yourself to a maximum of 80 work hours per week?	44/67 (65.7%)	269/476 (56.5%)	.16
Are you off work for at least 4 days per month?	55/67 (82.1%)	372/481 (77.3%)	.38

ACGME = Accreditation Council for Graduate Medical Education.
*Chi-squared test.

Earlier AMA data showed that the hours per week spent on patient care by physicians steadily increased, from 46.3 in 1976 to 52.2 hours in 1986.¹⁹ Another AMA report in 2001 reported the mean work week for physicians as 57.8 hours, similar to the mean of 59.6 hours found in our study. Furthermore, that same AMA report stated that between 1989 and 2001, physicians in Ohio spent an average of 58.8 hours per week in professional activities.²⁰ Finally, a recent study by Shiotani and colleagues, reviewing hours worked by internists in all medically related activities in 2000-2001, found the mean work week to be 57.2 hours.²¹

Limitations of survey studies are well known. The 44% response rate for our study is within the 40%-50% range reported earlier for physician surveys.^{22,23} It may be that our respondents are not representative of our physician population. Nevertheless, with a large absolute number of respondents (n = 570), we may have captured the knowledge and practice of a varied body of physicians working in a smaller urban and suburban setting. Our results might not be generalizable to the US physician population as a whole. However, the Dayton metropolitan area is representative of a midsize Midwestern city with high-quality specialty and subspecialty health care and numerous medical education programs.

Our study shows that physicians in practice have work hours that are congruent with the ACGME duty hours regulation standards. Residents and fellows are working hours similar to those they will likely experience after completion of their training. As the debate over resident duty hours continues, policymakers must consider the effect of any further reduction in work hour standards. Studies relating number of hours worked, physician fatigue, and patient safety remain controversial. Volpp et al reported on 2 large investigations.^{24,25} One study found no change in mortality among Medicare patients for the first 2 years after implementation of duty hours regulation at general US nonfederal hospitals;²⁴ however, in teaching-intensive Department of Veterans Affairs hospitals, mortality for patients with 4 common medical conditions decreased.²⁵ In their systematic review, Fletcher and colleagues found that the associations between reduction of resident work hours and patient safety have been scanty and inconclusive.²⁶

If the current ACGME duty hours regulation standards are congruent with acceptable physician work habits, a further reduction in resident duty hours may not be the most beneficial course of action. Creating alternative graduate medical education structures fo-

Table 5 Physician Work Hours: Comparison by Type of Practice

	Solo	Group	Academic	P Value*
Number with a minimum of 10 hours between shifts	57/88 (64.8%)	275/371 (74.1%)	53/68 (77.9%)	.13
Number with a maximum of 30 continuous work hours	54/88 (61.4%)	240/367 (65.4%)	38/70 (54.3%)	.19
Number with a maximum of 80 work hours per week	48/85 (56.5%)	213/370 (57.6%)	38/70 (54.3%)	.88
Number with a minimum of 4 days off per month	40/84 (47.6%)	323/375 (86.1%)	49/71 (69.0%)	<.0001†

*Chi-squared test.

†Group practice > academic practice and solo practice, $P < .001$; academic practice > solo practice, $P = .007$.

Table 6 Physician Work Hours: Interaction between Type of Practice and Years since Residency Completion

	Solo Practice†		Group Practice‡		Academic Practice§	
	<5 Years Res Comp*	≥5 Years Res Comp*	<5 Years Res Comp*	≥5 Years Res Comp*	<5 Years Res Comp*	≥5 Years Res Comp*
Number with a minimum of 10 hours between shifts	3/4 (75%)	53/83 (63.9%)	37/43 (86%)	236/326 (72.4%)	9/11 (81.8%)	44/57 (77.2%)
Number with a maximum of 30 continuous work hours	3/4 (75%)	51/83 (61.4%)	35/44 (79.5%)	204/321 (63.6%)	6/12 (50%)	32/58 (55.2%)
Number with a maximum of 80 work hours per week	2/4 (50%)	46/80 (57.5%)	30/44 (68.2%)	183/324 (56.5%)	7/12 (58.3%)	31/58 (53.4%)
Number with a minimum of 4 days off per month	1/4 (25%)	38/79 (48.1%)	40/44 (90.9%)	281/329 (85.4%)	8/12 (66.7%)	41/59 (69.5%)

*Res comp = residency completion.

†All solo/residency completion $P > .60$ (Fisher's exact test).

‡Group practice/residency completion: rules for 10 hours, 80 hours, and 4 days off per month, $P > .05$; 30-hour rule, $P = .036$ (chi-squared test).

§All academic practice/residency completion, $P > .75$ (Fisher's exact test).

cusing on patient-centered learning within the present duty hour boundaries and health care environment may prove more efficacious. Continued study of physician work hours, physician fatigue, and patient safety will help meet the challenge of maintaining safe and effective medical care systems where residents, fellows, and practicing physicians continue to learn, serve the public, and enhance the quality of health care.

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