Are Continuity Clinic Patients Less Satisfied When the Resident Is Postcall?

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Due to recent public debate and newly imposed resident work hour restrictions, we decided to investigate the relationship of resident call status to their ambulatory patients' satisfaction. Resident continuity clinic patients were asked to rate their level of satisfaction on a 10-point Likert-type scale. Using multiple regression approaches, these data were then assessed as a function of resident call status. We found that in 646 patient encounters, patient satisfaction scores were significantly less when the resident was postcall, 8.99 ± 1.8 , than when not postcall, 9.31 ± 1.3 . We herein discuss etiologies and implications of these findings for both patient care and medical education.

KEY WORDS: patient satisfaction; internship and residency; outpatient clinic; work.

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Resident work hours stimulate controversy throughout all areas of academic medicine. There has been much debate recently regarding adverse affects of long work hours on the health and education of the residents and on the patients they treat.¹ Although making headlines lately, resident work hours is not a new topic.^{2,3} More salient, however, is the Accreditation Council for Graduate Medical Education (ACGME) approval of resident work regulations effective in all disciplines as of July 1, 2003. These regulations stipulate that residents will work no more than 80 hours per week, be oncall no more frequently than every third night and for not more than 24 hours, will not accept care of new patients after 24 hours, must be allowed 10 hours of rest time between daily duty periods, and have

one full 24-hour day per week free from all clinical, educational, and administrative duties.⁴

Defenders of traditional long resident work hours cite the need for physicians in training to experience the chronology of a patient's disease, acquire a sufficient amount of procedures, and avoid miscommunication of patient information at the change of shifts.^{3,5} However, multiple studies have found that sleep-deprived residents are significantly more likely to have poorer recall, less verbal fluency, anger management problems, and be prone to errors on physical exam, electrocardiogram and laboratory interpretation, medication prescription, and procedure performance.⁶ Residents have even admitted to medical mistakes related to fatigue.⁷ Also very concerning is resident personal safety as after working long hours, residents are known to have more personal obstetric complications, worse reaction times, lower vigilance, and a higher rate of motor vehicle accidents.⁶

Nevertheless, no study to date has linked resident call status to patient outcomes. We believed a patient outcome most susceptible to be adversely affected by resident fatigue would be patient satisfaction. For example, known components of patient satisfaction include doctor-patient communication, time spent with the physician, waiting time, and so on, all of which could be adversely influenced by physician fatigue associated with being oncall the previous night or from ongoing inpatient obligations.⁸ Therefore, the purpose of this study was to determine whether continuity clinic patients were less satisfied with their visit when the resident was postcall.

METHODS

The study setting was one university-based, general internal medicine continuity clinic constructed for the training of internal medicine resident physicians. Institutional review board (IRB) exemption was granted due to the noninvasive nature of survey research. The study subjects were the residents in our training program and their continuity clinic patients. Each resident sees 3 to 6 patients in their 1 to 2 weekly afternoon clinics. Postcall residents see the same number of patients as residents who are not postcall (with the new ACGME work hour regulations, our postcall residents no longer have clinic). Four residents are assigned to one attending to whom each patient case is presented. Historically, the approximately 65 residents in our program are predominantly U.S. graduates (90%) and male (57%). Each resident class on average consists of 13 categorical, 5 primary care, and 6 medicine-pediatrics trainees. Categorical interns have only one continuity clinic at the

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Table 1. Patient Satisfaction Instrument

Item	Strongly Disagree					Strongly Agree				
The doctor I saw today:										
1. Explained things well	1	2	3	4	5	6	7	8	9	10
2. Listened and paid attention to what I had to say	1	2	3	4	5	6	7	8	9	10
3. Spent enough time with me during my visit	1	2	3	4	5	6	7	8	9	10
4. Treated me with respect	1	2	3	4	5	6	7	8	9	10
5. I would recommend my doctor to friends and family	1	2	3	4	5	6	7	8	9	10
6. Overall, I am pleased with my doctor	1	2	3	4	5	6	7	8	9	10
7. I was satisfied with my clinic visit today	1	2	3	4	5	6	7	8	9	10

Veterans' Affairs hospital and were not included in our study. Primary care, medicine-pediatrics, and senior categorical residents have at least one university-based clinic per week. Our continuity clinic patients' demographics are 59% women, 66% high school graduates, and 20% under-represented minorities, and range in age from 16 to 100 years. The payer mix consists of 36% commercial insurance, 36% Medicare, 20% Medicaid, and 8% self-pay. Clinic setting, staff, and organization were very similar during both sample periods.

In our institution, we have no night float system and therefore a resident's call night is extremely variable. There is often some degree of rest that is usually interrupted by new patient admissions or "cross-cover" issues, especially on the intensive care rotations. Ward teams typically carry 5 to 10 patients and are on call every fourth night while intensive care residents may follow more patients and are on call every third night.

The study design was a cross-sectional study in which continuity clinic residents and their patients were surveyed after their encounters with each other to assess patient and physician satisfaction. Data were collected over 2 summer periods (June and July of 2001 and 2002) coincident with the availability of research assistants (2 medical students each year) for data collection. Patients were a convenience sample of continuity clinic patients presenting for care during the study periods and selected for inclusion based on the availability of the research assistants. The research assistants who approached the patients in the waiting room after the visit were not aware of the patients' resident physicians and therefore also unaware of their resident's call status. Patients who agreed to participate in a satisfaction study (8 to 12 per day) were asked to rate their level of satisfaction on a 7-item, 10-point, Likert-type, scale (1 = strongly disagree, 10 = strongly agree) using items focusing on personal aspects of the physician derived from commonly used patient satisfaction instruments such as the Patient Satisfaction Questionnaire and Medical Outcomes Study (Table 1).^{9,10} Coefficient α for the instrument was 0.94. Reflecting this coefficient α and similar to most patient satisfaction instruments, the interitem correlations were very high across all 7 items. Factor analytic procedures yield a 1-factor solution by both scree plot analysis and examination of Eigenvalues (inclusion of factors with

Eigenvalue ≥ 1). Factor loadings of all items are $> .72$. Therefore, our measure of patient satisfaction was the mean score across all 7 items. Patients were also asked to estimate the time they spent waiting in the waiting room and in the examination room as 0 to 5, 5 to 15, 15 to 30, and over 30 minutes. In addition, residents were asked at the end of the clinic day to indicate their call status and assess their satisfaction with patients seen that day in response to "I was satisfied with this visit" on a 5-point Likert-type scale (1 = strongly disagree; 5 = strongly agree).

The analysis was performed using the general linear model. Multiple regression approaches examined patient satisfaction and resident satisfaction with each visit as a function of resident call status, patient perceived wait time in the reception area and in the examination room, and subject demographics including patient age, gender, and insurance. Patient waiting time was included because this variable has been repeatedly found to be a major component of patient satisfaction.^{8,9,11} In some analyses, patient satisfaction was considered a continuous variable and defined as the mean rating across the 7 items of the survey. Alternatively, in separate analyses and similar to other studies, patient satisfaction was considered a categorical variable and operationalized as completely satisfied or not (ratings of 10 on all 7 items versus not, ratings of 9 or greater on each item versus not, etc.).^{9,11-13} Results were similar whether patient satisfaction was measured as continuous or categorical variables. Results of the linear regression analysis will be presented below.

There are no conflicts of interest of any kind for the corresponding author, coauthors, research assistants, or study subjects.

RESULTS

Data were collected from 1,394 patient encounters with 97 resident physicians. Of these, 646 (46%) were matched with patient satisfaction data obtained postvisit from patients by research assistants with no knowledge of the call status of the resident physician. Fourteen interns (13.6%) saw 51 patients (7.9%), 38 second-year residents (39.2%) saw 194 patients (30%), and 45 third-year residents (48.2%) saw 401 patients (62.1%). Few patients or residents approached declined to participate.

Table 2. Patient and Resident Satisfaction by Call Status

	Patient Satisfaction	Resident Satisfaction
Not postcall N = 537	9.31 ± 1.3	4.25 ± .98
Postcall N = 109	8.99 ± 1.8*	4.12 ± .84

* Not postcall versus postcall comparison; $P = .03$.

Nonparticipating residents were not identified because of IRB concerns that the supervisor status of the researchers might influence opportunity to refuse participation. Of these, 109 encounters (17%) occurred when the resident was postcall. As in most patient satisfaction studies, the mean patient satisfaction in our clinic was quite high, 9.25 ± 1.4 . When controlling for wait time and patient demographics, being seen by a postcall resident was an independent predictor of decreased patient satisfaction ($F_{1,638} = 4.71$; $P = .03$). To put this in practical terms and as shown in Table 2, patients seen by a postcall resident were significantly less satisfied (8.99 ± 1.8) than those seen by a resident who was not postcall (9.31 ± 1.3), adjusting for the other variables in the model. Interestingly, resident satisfaction was not significantly different when postcall versus not postcall (4.12 and 4.25 , respectively; $F_{1,638} = 1.74$; $P = .34$). The findings did not differ between the two sampling periods.

DISCUSSION

As we hypothesized, patient satisfaction was less for continuity clinic patients being cared for by a postcall resident. To our knowledge, this is the first work demonstrating an adverse patient outcome related to long resident duty hours. We were surprised, however, that residents were satisfied with these postcall patient encounters.

Although statistically significant, one might wonder about the “clinical” significance of the difference in satisfaction for patients seen by postcall residents (8.99) versus not (9.31), an absolute difference of about 0.32 on the 10-point scale. However, this difference of 0.32 represents an effect size of approximately one-quarter of a standard deviation in patient satisfaction. Although this would seem to be small, it represents about two-thirds the effect size of waiting time, which, in our sample, is correlated -0.25 with patient satisfaction. In addition, although greater patient satisfaction has been linked to improved patient outcomes, measuring patient satisfaction poses its challenges, and among those challenges is that patients are reluctant to criticize their physicians and generally rate physicians uniformly high on patient satisfaction instruments.^{9,14,15} Therefore, even small decrements in satisfaction are thought to indicate substantial underlying dissatisfaction with care.

This study is important in this new era of physician training and lends support to the notion that patient care is adversely affected by long resident call hours. However,

strategies to reduce resident work hours and fatigue may have unforeseen consequences. For example, a common strategy to reduce resident work hours is to implement a “night-float” system. However, Griffith, Wilson, and Rich found that inpatients were more satisfied in a “long call” system rather than in “short call” and night-float systems.¹² In addition, Barden et al. showed that although faculty and residents feel such work hour restrictions improve the quality of life, the continuity of patient care is compromised, especially from a night-float system.³

Our study has several limitations. First, this study was done at a single institution and may reflect the idiosyncrasies of our resident continuity clinic and training program. Second, data were collected over 2 summer months. In June, many of the residents were quite seasoned. Although we had few interns in clinic in July, the rising second-year residents may have been less adept in their supervisory role on the inpatient service, and may have performed less well postcall than more experienced residents. Or, conversely, the residents may have been fresher in July and our results could have been more dramatic later in the academic year. Studies encompassing an entire academic year are warranted. Third, we included no measures of the difficulty of the residents’ call nights, such as the number of admissions, acuity of the inpatients, or amount of rest. Some of our residents may have been relatively well rested and our findings may have been more dramatic focusing on the most exhausted residents. Furthermore, there could have been other unmeasured variables responsible for the findings such as outpatient or inpatient load, diagnostic or therapeutic complexities, or even attending physician variables. Fourth, we focused only on patient satisfaction and did not take into account other clinical outcomes such as medical errors, admission rates, number of tests ordered, duration of encounters, or cost of care. Fifth, this was a convenience sample of clinic patients and those participating may not be representative of all clinic patients. Sixth, we did not observe resident-patient interactions and cannot comment on any differences in the doctor-patient interactions between postcall and nonpostcall residents that in turn could have accounted for the observed differences in patient satisfaction. Finally, as this was a cross-sectional study, we can only demonstrate associations rather than causal relationships.

Despite these limitations, this study provides evidence that postcall status in our study was inversely associated with one patient care outcome, patient satisfaction. We believe that this is an important finding that adds support to the new ACGME regulations. Further research will need to address the limitations noted in our study design, other aspects of workload besides postcall status, the relative impact of the various strategies implemented to address work hour restrictions and reduce workload, and outcomes of care in addition to patient satisfaction, such as those noted above. In addition, as such a training pattern (afternoon clinic when postcall) no longer exists because of the new ACGME regulations, future research will have a

benchmark by which to compare patient satisfaction in the new era of medical training with better-rested but potentially busier resident physicians.

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