Hypothesis: We attempted to better quantitate resident work within our system of care.

Design: Survey.

Setting: Academic training program.

Participants: Surgical residents.

Interventions: A work-hour survey was developed defining 5 areas of activity: patient care related to educational objectives, required educational activities, patient care activities unrelated to educational objectives, off-duty educational activity, and off-duty hours.

Main Outcome Measures: Total work hours and non-educational work hours were analyzed by resident level, rotation, and category.

Results: The survey response rate was 52%, covering 110 workweeks. Residents worked 80 hours or less for 57 weeks and more than 80 hours for 53 weeks. The mean number of hours worked was 77. Fewer than one quarter (21.9%) of work hours were unrelated to educational activities. The amount of time spent in noneducational activities was lowest at community hospitals (17%) and similar at the Veterans Affairs (23%) and academic (22%) medical centers. It did not vary by total hours worked, averaging 21% for rotations of more than 80 h/wk and 23% for rotations of 80 h/wk or less.

Conclusions: Residents spend a large amount of time in noneducational activities. Eliminating these activities would bring our rotations into compliance with the 80-hour workweek. It would also generate a large amount of time for educational activities within our training program.
Residents returned data on 110 workweeks, for a response rate of 52% (210 total possible workweeks). The response rate varied from 41% for postgraduate year 2 (PGY-2) residents to 72% for PGY-5 residents, with significantly higher response rates for PGY-5 residents compared with PGY-4, PGY-3, and PGY-2 residents. No other significant pairwise differences were seen. Data from all surveys were included, even if the weekly total was less than 168 hours. For this reason, 250 hours were not accounted for. These hours were not included in any category. The fewest number of hours worked was 22 by a PGY-4 resident, with a maximum of 123 hours by a PGY-1 resident. The distribution of the types of activities done during work hours was similar by PGY level and rotation site, as well as by time of year the survey was administered (Table 1 and Table 2). The variation in required educational time is primarily due to the 3-hour variation in the amount of required conference time between rotations and, to a lesser degree, to variable attendance at these conferences. There is no difference in attendance requirement by resident postgraduate level. The percentage of total work hours devoted to nondoneducational patient care varied from 10% to 31%. This was lowest for PGY-4 residents, with PGY-1 residents working significantly more nondoneducational hours than PGY-3 and PGY-4 residents (Table 1). The percentage of time spent in nondoneducational patient care also did not differ significantly by rotation site (Table 2).

As a whole, the program was compliant with the 80-hour workweek, averaging 76.6 h/wk (Table 1). However, the workweek ranged from 22 to 123 hours, and during 53 weeks, residents worked more than 80 hours. The percentage of time spent in nondoneducational patient care did not vary by compliance with the 80-hour workweek, averaging 21% for rotations of more than 80 h/wk (53 weeks) and 23% for rotations of 80 h/wk or less (57 weeks) (P = .48).

Our residents spend approximately 23% of their on-duty time in nondoneducational activities. This is almost 17 h/wk, 68 h/mo, and 816 h/y. If this amount of time could be identified and isolated from the residents’ current schedule,
what could be done with it? The opportunity this provides is enormous, from 2 different but equally important perspectives. First, eliminating these service hours would allow compliance with the 80-hour workweek without major restructuring of the educational program. Although some might argue that some service activities provide educational opportunities, the education is usually subordinate to service. The reality of having trainees’ hours limited forces us to consider other options to achieve whatever educational value these service activities may provide.7,8

The second, and more important, opportunity comes in thinking of these hours as potential educational hours. Educational experiences need to be planned and scheduled; we have a responsibility to teach our trainees rather than just letting them experience patient care and hoping they end up as competent surgeons at the end of their training. This approach will require more curriculum and faculty development for all of us and will need to be focused on the Accreditation Council for Graduate Medical Education competencies.3 The model may need to incorporate aspects of graduate school curricula, rather than the experiential or immersion model that has functioned as the foundation of surgical residency for so long.5,7,8 Carefully planned conferences, study hall, skills laboratory training, and guided self-study are ideas that need to be explored and adopted more widely.7,8,10-12 Even the operating room, an obvious educational venue, is underused.13

Threatening this discussion is the question about who should pay for the paradigm shift. There is no question that it is expensive. In 1990 dollars, the estimate in New York was that $33 million would be required to hire physician assistants to replace surgical residents and become compliant with the 80-hour workweek. This did not include the more than $64 million estimated for ancillary services.2 To help with these costs, approximately $226 million of state funding was made available to hospitals in New York.14 Such additional funding does not appear to be forthcoming for the rest of the country. Graduate medical education is now funded by Medicare, Medicaid, hospitals, medical schools, voluntary health organizations, and faculty practice plans.15 Each makes the case that the others should fund the current workforce shortage occurring as a result of decreased resident work hours, and programs must try creative solutions to get by.

Framing the question as service vs education may help find solutions. If the service aspect is paramount, then funding from the service part of our health care system is logical. If education is our goal, different strategies may be necessary. This might need to occur as reallocation of graduate medical education Medicare dollars, more medical school support financing of clinical faculty educational efforts, or even tuition for medical education from resident trainees.

Our data have weaknesses: a 52% response rate and the bias of self-reporting. We asked our trainees to help define the categories and asked them to be the arbitrators when categorizing their hours. The similarity between sites and years suggests that the trainees were consistent in their use of the survey tool. This similarity suggests that more responses would not have changed the overall results, and that the residents rate the same activities as having similar educational value. Fosse and DaRoza16 found that residents perceived programs as more heavily weighted toward service, while program directors believed the same programs emphasized education over service. We tried to overcome this potential bias by having residents code activities rather than general impressions, and by reviewing the survey with the residents before implementation. Our residents report more time in noneducational activities than a 1990 study7 done with similar methods; 9% of the residents’ working hours in a program with 2 federal and 5 private hospitals were spent doing ancillary tasks. At that time, the overall workweek averaged 90 hours. In this 1990 study, on-call sleep was categorized separately, accounting for approximately 10% of the total working hours. With the increased patient load and fewer residents in the hospital at any one time, our residents do not sleep much on call. In addition, there was no distinct category on our survey for on-call sleep. In many cases, the residents viewed this as time away from family, not of any educational value, and not directly related to patient care, so it was often coded as noneducational time.

We have continued to monitor our trainees’ work hours, but have simplified the tool at the residents’ request and now do not track categories of work hours. Compliance with the 80-hour workweek has improved, with an overall mean of approximately 70 hours and with 30% of reported weeks comprising more than 80 work hours (compared with almost 50% before July 1, 2003).

Our data have been used to alter our patient care environment. Residents have been reallocated, particularly the PGY-2 residents. We have increased the number of physician extenders from 6 to 13½ full-time employees. Whether they have reduced the residents’ noneducational time is unknown, although a reduction in hours and change in tasks for residents after the addition of health care technicians and physician assistants have been recently reported.17,18 Hospital support has come in the form of a blood-drawing team and an intravenous line team. However, the culture of calling residents for minor details of patient care and clarification of orders continues.

We believe our trainees’ assessment of their noneducational hours is accurate. Some activities that the residents consider noneducational include tracking down radiographs, waiting to round with individual staff, and coordination of care and paperwork associated with discharging patients. They also continue to do more traditional service activities at the Veterans Affairs medical center, including drawing blood, performing electrocardiograms, and transporting patients. Hospitals and our medical practices must invest in information technology,19 more hospital support personnel,17,18,20 and initiatives that reduce patient, nurse, physician, and resident frustrations.21 As this is done, our programs must look at ways to use the time we free up from our trainees’ daily schedules to enhance their educational experience.

Assuming that half of the noneducational time, or 8½ hours per week, is available to all of our programs, how should we proceed? Focusing on excessive hours deals only with the symptoms, not the root cause of the problem.22 It is unfortunate that much of the work-hour discussion focuses on resident health and satisfaction, patient outcomes, and costs.23 What is missing is the Ac-
cRediation Council for Graduate Medical Education emphasis on competency and outcome; the discussion should be centered on how to educate competent surgeons and how best to use the time from an educational perspective. After all, the initial impetus for work-hour restrictions theorized that excessive hours led to incompetence.24 Our challenge is to think of how we can improve our educational program to maximize the educational potential of all 80 hours and to graduate competent physicians. Such a shift will force many changes within our academic medical centers. It will change daily faculty activities, faculty compensation plans, and deans' budgets and will help focus our training programs on our educational mission.14,15,26,27 Our concern over work hours and competencies is part of a changing medical education environment. We need to use every available approach to meet the challenges of training our future surgeons. Using time that we “borrow” from our service activity will only be one, and perhaps the least important, approach.

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trying to batch their calls, etc. We have not been able to imple-
tment that with any success to try to decrease the noneduca-
tional time of the residents. As we have tried that model, I am
not sure where exactly it has broken down. It is probably a com-
bination both in nursing leadership and nursing culture, as well
as the physician culture and the resident culture in Milwau-
kee. I would agree that we have had more of an immersion or
an experiential model, and I think that paradigm has to change.

Jerry M. Shuck, MD, Cleveland, Ohio: Dr Brasel, I re-
ally appreciate you putting this on the program. There is a bur-
genning cottage industry now of seminars on duty hours and
seminars on competencies. These programs are very well at-
tended because program directors are worried. They are not
only worried because of the restrictions of these new rules, but
they are worried because of reports of summary withdrawal with-
out probation and the probation of some programs at presti-
gious institutions. We need to make changes fast, but can we
afford the changes? Most of us can’t hire 50 to 80 PAs as done
at some institutions. No hospital can afford these things now.

What are the residents really doing in those 17 hours of
“wasted time”? It is not really drawing blood and carting pa-
tients around; that is over. Are they waiting for reports and try-
ing to get a patient discharged? Sometimes, up to 6 forms, in-
cluding discharge summaries that are 3 pages long, consume
many hours. Why hire an expensive PA when you can hire an
entry-level secretary for those things? A better understand-
ing of how residents are using those 17 hours would help us all.
Maybe you can elaborate about complaints related to dis-
charges and paperwork, rather than other activities that are ac-
tually quite mythical.

Dr Brasel: The ancillary staff that people are talking about
now really are not the IV teams and the blood-drawing teams,
but they are people who are able to manage and track infor-
mination. Even our nurse practitioners and our nurse clinicians
who help with a lot of that paper tracking have complained that
they are overqualified for much of the information transfer that
is being shifted now more towards the nurse practitioners and
nurse clinicians. There have been a few studies that have looked
at the health assistant/health technologist as somebody to work
with that information transfer. Those people are some of the
ancillary support staff that are going to have to take some of
the information overload and really getting back to both more of the fo-
cus on actual education rather than the administration of much
of the training program and focusing on taking care of patients
will help, but I certainly don’t have the answer to that question.

Thomas A. Stellato, MD, Cleveland: Can you tell us when
the residents actually filled out the survey? Was it at the end
of their workday, at the end of the week, end of the month?
That time might indicate some of the accuracy of the survey.
And secondly, can you tell us about that resident who had the
22-hour average workweek?

Dr Brasel: The 22-hour average workweek was on endo-
scopy, where they are supervised to a much lesser degree. They
do a few scopes, and they have the opportunity to stay and do
more or those that choose to go home. Some do not know
whether our residents completed the surveys at the end of the
day or at the end of the week, but they were required to turn
them in at the end of the week. So at the very most, the time
bias or recall bias would be 1 week. Some fill out their hours
on a daily basis, and some do it at the end of the week.

Vijay K. Mittal, MD, Southfield, Mich: I just wondered
about changes in the curriculum. What are you considering
changing in the time spent for teaching? Are you going to con-
solidate the lectures for the week in one day, and how are you
complying with the chief residents’ working hours, because that
is very difficult for us.

Dr Brasel: Our chiefs are as in compliance or as out of
compliance as the rest of the service or the rest of the resi-
dency. On trauma, the chiefs, as well as the rest of the resi-
dents, go home post call so whether they are a IV or V chief on
the trauma service, they go home post call. The rest of the chiefs
have home call, and because all of the acute general surgery is
taken care of by the trauma service, home call for the most part
for the chiefs on the other services does not end up counting,
because they are not disturbed maybe but once a night.

The curriculum is certainly something we are struggling
with both locally and nationally, and the question is if we have
a more defined and uniform curriculum, not only locally but
across the country, will that help with some of the work hours
and some of the struggles with trying to come up with differ-
ent things for every specific program?

Norman C. Estes, MD, Peoria, Ill: I am concerned about
the design of this study. There are many hours spent which the
residents call scut which are necessary parts of patient care, a
required competency to understand health systems. The best
value of this resident assessment is to see how the residents per-
ceive how they spend their time. Then have an in-depth dis-
cussion to try to correct the program. The hospital is our class-
room, and there is a lot of variation in each hospital. Each
program has to correct as they can.

Dr Brasel: As I said, the residents reported, and it is a self-
report, so there is some bias. Other than a time and motion study
that would be very difficult and also very expensive to com-
plete, this at least allowed us to get an initial handle on this
situation; they do spend an inordinate amount of time doing
things that in an immersion may have been educational once,
but I think we have to get away from that philosophy.

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