

Few issues in surgical education have caused as much controversy as the regulations in resident work hours instituted by the American Council of Graduate Medical Education (ACGME) in July 2003. Residents would be forced to work shorter shifts. Medicine—surgery, in particular—would never be the same.

It is common knowledge that sleep deprivation and fatigue can impair an individual's ability to think clearly and blunt his or her normal physical response. The recognition that pilot fatigue is a risk factor for airplane crashes¹ led the Federal Aviation Administration to limit the number of hours that a pilot can be on flying duty.² In the setting of guidelines like these, the Bell Regulations on resident duty hours in New York,³ and increasing evidence that resident fatigue is associated with medical errors and motor vehicle accidents,⁴⁻⁷ the ACGME regulations were just a natural next step.

But if it were indeed a natural next step, why were these new regulations faced with so much resistance among the surgical community? Why did they cause so much uproar among some of the same residents whose quality of life the regulations were trying to improve? The entrenched belief that surgeons are not susceptible to the

deleterious effects of fatigue and sleep deprivation may have played a role. But, most importantly, the resistance likely came from the fact that the new regulations defied the very same Halstedian principles upon which surgical residency was built.

This article will analyze some of the perceptions that surgeons, surgical residents, and medical students have regarding the regulations and will try to identify and tackle some of the challenges that we are facing as we “seamlessly” transition to a world with an 80-hour workweek. This article will also describe these perceptions and challenges as they affect residents' quality of life, patient care, and surgical education.

Quality of life

Balancing act. There is overwhelming agreement that the new 80-hour workweek regulations have improved the quality of life for residents outside of the hospital. Several survey studies applied to residents in New York after enforcement of the Bell Regulations on resident hours have found that a majority of residents improved their overall quality of life, felt better rested, were better able to perform responsibilities outside of work, spent more time with their families, and were generally emotionally happier.⁸⁻¹⁰ A recent study analyzing

The surgical training gap:

The new era of the surgical trainee

by

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the perceptions of residents one year after implementation of the ACGME regulations found that more than 70 percent reported an improvement in the quality of their personal relationships and their quality of parenting.¹¹

“It has definitely been a good thing. My life is much better. I have more time for my family and to pursue different interests. I feel more rested and significantly happier.”

—PGY-4 resident

Similarly, a PGY-1 resident said, “Having free time out of the hospital allows us to have a healthier lifestyle. Besides being physicians, most of us are also parents, fiancés, friends, siblings.”

It is becoming more evident that, in general, the new generations are placing more importance on work-life balance and family responsibilities when making their career choices.¹² Nowadays, medical students seem to be more concerned with lifestyle issues and the amount of work when selecting a specialty.¹³ Although not the most important factor, the 80-hour workweek has made a surgical career slightly more appealing to medical students¹⁴ and may improve the ability to recruit them to this profession. As a medical student said, “While most agree that they would like to work fewer hours, few would exchange personal satisfaction solely for lifestyle during residency. Reducing the amount of hours worked during residency is attractive but it is not the sole determining factor for medical students as they decide on a specialty.”

This boost in interest is clearly evident by the recent increase in applications to surgical residency. However, it poses questions regarding the quality of the medical students and their level of commitment to a surgical career. The answer to such questions is unlikely to become evident in the near future.

“I really do think the 80-hour rule attracted more people to surgery who really don’t know what they’re getting themselves into. People think that equilibrating the work hours means that all residencies are close to being the same. In reality, you can’t always adhere to stringent rules when it comes to patient care, and when expectations of residency are at odds with this,

people start to resent their training.”

—PGY-3 resident

Work ethic. Unfortunately, the same positive effects in the quality of life of residents outside of the hospital have not been uniformly seen in the quality of life inside of the hospital. Although some reports show that more than 40 percent of residents think that the regulations have improved their quality of work life⁹ and increased their enthusiasm and satisfaction with surgery,¹⁰ some have shown that the residents’ work ethic has deteriorated.⁸

The changes in quality of life at work appear to be dependent on the seniority of the residents. A larger proportion of senior residents have noticed worsening in the quality of life at work when compared with junior residents.⁹ This appears to be result of an apparent shift of some of the responsibilities from junior to senior residents.^{9,11} Also worrisome, albeit less studied, is the apparent shift in responsibilities from residents and fellows to attending surgeons in some programs.^{11,16} This is probably more evident in programs that have limited ability to hire physician extenders such as physician assistants and nurse practitioners to cover the work traditionally done by residents. Furthermore, because of the current imperfect solutions to transfer of care between residents, attending surgeons have had to play an increasing role in providing continuity of care.

“I don’t know if faculty are working harder, but they need to be more aware of their patients. New faculty, in particular, tend to be more cautious to make sure things don’t fall through the cracks.”

—Young surgeon

Part of the impact of the regulations in quality of life at work may be also related to the sense of commitment and accomplishment of the residents and the way they are perceived by peers and faculty. Traditionally, an outstanding resident would show exceptional commitment by staying in-house until his or her patients were optimized and no menial tasks were unsettled. Another resident would then kindly monitor the patients for several hours to allow the resident to catch some sleep. The sense of accomplishment derived mainly from that perception of ownership and from the realization that

the outcome of the patient was intimately related to the diligence of the resident. Residents are now forced to abide by the rules; they are required to go home. This would not represent a problem if not for the fact that, in the eyes of some of the faculty and residents themselves, the quality and commitment of a resident is still measured in terms of the traditional framework. At what time did the resident leave at night? At what time did he or she come in to pre-round? How many menial tasks were signed out in the evening? Residents are thus faced with a dilemma.¹⁵ How can they demonstrate commitment to their patients, sense accomplishment, and, at the same time, comply with the regulations? Assuming that the rules will not change, we will have to rethink our views on what responsibility and commitment ought to mean in the new era of surgical training.

“I am wary of people who say that you are ‘hard-core’ just because you [spend] more time in the hospital. That makes no sense. Staying in the hospital [longer] doesn’t make you a better resident; taking care of patients and being more efficient does.” —PGY-2 resident

Patient care

Even though the main aim for the ACGME regulations was the improvement of patient care by preventing fatigue-related medical errors, it is unclear if they have really accomplished the goal. Only 20 percent of residents believe that the regulations have improved the quality of patient care.^{9,11} The other 80 percent are equally split in believing that patient care has either worsened or remained the same. This perception tends to be more prevalent among senior residents¹⁰ and is usually ascribed to an erosion in continuity of care.^{9,11}

“Old-school physicians state that the 80-hour workweek schedule decreases the quality of patient care. Their main allegation is that working only 12 hours per shift promotes ‘discontinuity of patient care’ and therefore medical errors,” a PGY-1 resident says. “Although this statement seems reasonable, it is not totally true. Working 80 hours per week gives the resident the ability to cover 10-12 hours of work per day, at his or her maximum capacity of alertness and energy, avoiding the potential of prolonged shifts that promote medical errors.”

Team-based ownership. It is clear that if a single resident is not allowed to work for more than 80 out of the 168 hours that compose a week, more than two residents need to contribute significantly to the care of a particular patient. This scenario differs from the traditional one where a single primary resident would “own” the patient and be involved in almost any decision or event that pertained to that patient. A different resident would then cross-cover the patient some of the nights.

The new system cannot be expected to provide adequate continuity of care if we abide by the same prevalent ownership framework. The patients would be cross-covered more than half of the time. Patient ownership provides accountability, responsibility, and prevents the evasive statement, “It’s not my patient,” that the cross-cover resident may be tempted to utter when the patient needs care. It is therefore logical to switch from a resident ownership model to a team-based ownership. Thus, the team as a collective owns the patient and contributes to overall care.¹⁵ Residents on-duty should no longer be considered cross-covering residents—rather, they are members of the team in charge of their patients at a particular time. This framework change could provide not only an opportunity to comply with the regulations but could also improve the continuity of care that was disrupted during the few hours of cross-coverage when the primary resident was not in-house.

The cornerstone of such a *team-based system* has to be adequate communication. Because ownership is to be shared among team members, the flow of patient-related information between different members has to be effective. Haphazard sign-outs with minimal information will not be conducive to adequate continuity of care. It is surprising how a pivotal event in patient care such as the sign-out can be as archaic and unstructured as some of the sign-outs that occur every day.¹⁷ We ought to understand the importance of this transaction and provide some formal structure to maximize the information conveyed and minimize the probability of things falling through the cracks. The importance and degree of detail of the sign-out should not be affected by the desire of the outgoing resident to leave the hospital as early as possible.

It is necessary to foster a team environment with effective communication, shared responsibility, and maintained accountability. Such a system

would not only minimize the negative effects that the regulations could have in continuity of care but also accomplish the ultimate goal of improving the quality of care.

Residents or shiftworkers. One of the main pre-occupations of faculty and senior residents alike is the appearance of a shift-work mentality among junior residents and interns.

“The current night float system fosters a shift mentality. One can easily imagine a resident thinking: ‘I only have to last until 6:00 pm and then the night float can do xyz,’ or, ‘It’s 5:30 am; the regular team will be rounding in half an hour and can take care of it better.’”

—PGY-3 resident

The regulation of duty hours and even the designation of shifts should not lead people to procrastinate on work and leave it for others to do. A team-based approach—where both the day and night residents are equal members of the team, with the same degree of responsibility and patient ownership and held to the same standards—can minimize this attitude. It should not be acceptable for residents to become less efficient and leave tasks pending that could have been easily performed during the allotted time.

“Unfortunately, what has happened is that it has brought a shift mentality, a change that is not good among residents. It’s human nature: if you can get out of something because someone else can do it, people end up getting out of it. You justify it somehow but you eventually get out of it.”

—Young surgeon

Another way to make more efficient use of the required hours and deter some of the effects of this change in mentality is to add some flexibility into the system. In some instances, residents will need to stay later than usual to help with the team care of a particular patient. However, in instances where minimal work is needed, all members of the team should not be required to stay until a particular set time. This flexibility would average over time and may help maintain a sense of responsibility and stimulate a drive for efficiency that could work in favor of everyone involved.

Surgical education

One of the most important concerns has been the effect of the new regulations in surgical education. Residents have traditionally learned medicine and surgery by being completely immersed in the clinical environment for the duration of their training. A reduction in the time spent in the hospital could mean a reduction in clinical exposure and, potentially, a worsening in clinical education.

According to two different surveys of surgical residents, 35 percent to 40 percent of residents consider that the regulations in duty hours worsened their quality of training.^{9,11} This appears to be secondary to a perceived drop in the number of surgical procedures performed. Approximately 40 percent to 60 percent of residents report a decrease in the number of cases performed under the new regulations.⁸⁻¹¹

“Technical experience has suffered. It takes more time for the junior residents to get their numbers and to get proficient at surgical skills. The new residents may take up until the third year to get the technical expertise we used to get in our first year.”

—PGY-4 resident

Despite the perceived decrease in the number of cases by residents in one of the surveys, objective measures showed that the number of procedures performed by senior residents actually increased.⁸ Similarly, other objective studies have shown no change in the number of procedures performed before and after the institution of the regulations.¹⁸ An aspect of surgical education that may have suffered is the opportunity for senior residents to be teaching assistants in the operating room, an activity that is considered important in the education of surgeons. A recent study showed that there was more than a 40 percent reduction in the participation of two residents in the same case.¹⁹

The limitation on duty hours has increased the time available for residents to read about surgery. More than 50 percent of residents report that they read more than what they used to before the implementation of the regulations.^{8,11} Although some programs have reported better absolute scores in the in-training exam,⁸ some have shown no difference.²⁰

It is clear that the number of operative procedures, the amount of time that residents spend on reading, and the degree of direct learning from patient care depend on the particulars of the program and each resident's passion to learn. However, with decreasing time spent in the hospital, it is less likely that serendipity will allow residents to be exposed to the wide variety of learning experiences needed for surgical training. Resident training cannot be left to chance anymore. The traditional model of learning by osmosis and full immersion into the hospital environment needs to evolve into a more structured curriculum that maximizes the educational opportunities within the available exposure time.

Resident training should include a more structured and focused exposure to surgical procedures and patient care, and a formal curriculum that allows residents to learn and acquire the necessary skills for clinical practice. A first step toward this goal would include finding ways to decrease the amount of time spent by residents in noneducational tasks by the use of physician extenders and information technology. It is estimated that residents spend up to 30 percent of their time on menial, noneducational tasks,²¹ time that can be used to guarantee better educational exposure. These changes may cause an initial financial burden to government, programs, and hospitals, and will require an active intervention by faculty and residents alike. However, they are necessary for maintaining the training standards required to create the next generation of surgeons.

Can the three spheres be reconciled?

The new ACGME regulations provide a unique opportunity to revisit the structure of surgical training to improve the three spheres of experience that define residents: quality of life, patient care, and education. In order to reconcile these three spheres in the setting of the new duty hours, the core structure of surgical residency needs to be revised. Based on the perceptions of residents and faculty, and suggestions by other authors, we invite residents and residency training programs to consider the following judicious changes, which may help residents balance quality of life, patient care, and education:

Quality of life at work:

- Definition of responsibility and commitment

in terms of patient care and efficiency during work hours instead of in terms of the number of hours spent in the hospital

- Some flexibility in the system to minimize the "downtime" experienced by residents because of the unavoidable change in clinical work

Patient care:

- Change in the patient ownership scheme from an individual approach to a team approach
- Emphasis on the importance of communication and transfer of information between residents
- Use of more formal sign-out techniques and information technology for patient data transfer
- Work scheduled to minimize breaches in continuity of care by preventing excess patient transfer


Education:

- Creation of more specific and clear expectations for residents with continued accountability and responsibility for those expectations
- More formalized curriculum to maximize the value of in-hospital time and exposure to the wide variety of educational experiences needed for a comprehensive training
- Increase in the amount of feedback from faculty and senior residents
- Decrease in the amount of time spent by residents on noneducational tasks by the use of physician extenders and information technology

Despite the limitations and shortcomings of the new ACGME regulations, approximately 40 percent of faculty and 65 percent to 75 percent of residents support them.^{9,11,22} Furthermore, the

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regulations are here to stay; the 80-hour workweek is now the law. It is our duty as surgeons and surgical trainees to make the system work within the new regulations and ensure that, first and above all, patient care and safety are not compromised. We ought to enhance patient care delivery by means of well-rested and well-prepared residents on duty and at the same time enrich residency training and respect the time that residents spend outside of work for personal and family issues. However, patient care will have to remain our first priority. It is by these means that we will keep our profession as respected and noble as it has always been. 

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