

NEJM Perspective Roundtable

Residency Training — A Decade of Duty-Hours Regulations

Introduction

DEBRA WEINSTEIN: Welcome to a Perspective Roundtable from the *New England Journal of Medicine*. I'm Debra Weinstein, vice president for graduate medical education at the Partners HealthCare System in Boston and associate professor of medicine at Harvard Medical School. Over the past decade, policies regarding resident duty hours have changed substantially. In fact, changes to these policies are probably among the most profound changes in GME overall and certainly the most debated.

The goals of resident work-hour limits aren't particularly controversial. Protecting patient safety, enhancing learning and resident well-being all make sense. But right from the start, a number of people have argued that these goals aren't actually supported by limiting duty hours and might be undermined. So the debate continues.

In 2003, amid proposals for national legislation of resident hours and a petition arguing that OSHA should oversee resident hours, the ACGME implemented the first set of duty-hour standards that were common across all specialties. These standards included an 80-hour workweek, overnight call no more than every third night, and at least 1 day off in 7, all of which could be averaged over 4 weeks. In addition, shifts were limited to 24 hours of clinical duty, plus 6 hours. And breaks between shifts had to be a minimum of 10 hours.

In 2011, the ACGME promulgated revised regulations after evaluating a huge volume of input from various stakeholder groups and three commissioned literature reviews. The most notable new requirement was a 16-hour limit for intern, PGY-1, shifts. But there were also opportunities inserted for flexibility in applying the duty-hours requirements. The ACGME addressed related issues such as supervision, professionalism, workload, and fitness for duty as part of their updated requirements.

With me here today to discuss these issues are three colleagues who have thought deeply about duty hours. Vinny Arora is director for GME clinical learning environment and innovation and assistant dean for scholarship and discovery at

the University of Chicago. Brian Drolet is a resident in plastic surgery at Brown University and at Rhode Island Hospital. And Eileen Reynolds is the program director in internal medicine at Boston's Beth Israel Deaconess Medical Center. Thank you all for being here.

Professionalism

WEINSTEIN: When the 2003 requirements were rolled out, the predictions of doom included an erosion of professionalism — that we would train physicians to see themselves as shift workers and that that might undermine their ability to prioritize the patient's needs over their own needs. Eileen, from your vantage point as a program director, has this happened?

EILEEN REYNOLDS: I really don't think that professionalism has declined or that the residents see themselves as shift workers. We're fortunate to work with people who are incredibly dedicated and motivated to be physicians and to take care of people. And in my own view, their expectations of how the program should treat them have changed. And their expectations that there should be limits on how many hours in a row or total they should work have changed. But their commitment to taking care of the patients during those hours and transitions from those hours and their overall sense of professionalism toward medicine as a career or a profession, I really don't think that it has changed over the past decade.

WEINSTEIN: Another professionalism-related concern that has emerged surrounds this issue of reporting duty hours. And there've been a lot of claims that residents are misrepresenting the hours. Brian, do you see that as a reality?

BRIAN DROLET: I think there is a very difficult dilemma between taking care of patients and trying to meet the regulations that have been imposed both in 2003 and 2011. And as things get more strict, it becomes more difficult to meet the patient care needs, particularly if you think about being a first-year resident and being restricted to 16-hour shifts. If you have a critically ill patient, and you're trying to take care of that patient and sign out your other patients, and you're told that at 16 hours if you're not out the door, then you have a violation of your duty hours, that you have to make a choice. And professionally, is it the right thing to do to follow the regulations that have been imposed on you or to take care of the patient? And I think most physicians would say that obviously you take care of the patient. And then if you're concerned that violating the duty hours is going to put your program or yourself in jeopardy, that the right thing to do then is to not accurately report what happened, even though there are sort of ways around if you report your violations, there's supposed to be some degree of flexibility. It doesn't necessarily feel like that's the case.

VINEET ARORA: One thing we've noted with studies that we've done at our institution as well as validated at other places is that residents often take a lot of work home with them. I can send an e-mail to the residents about a patient after checking in on the record, and I get an e-mail right back saying, "Oh, I followed up and I ordered something, and I've put in a consult." And so we see that there's no hard end of the shift anymore. And even though they're out of the hospital, they're still thinking about their patients and they're still working. So that, in some ways, is reassuring, that the professionalism oath that they've taken to their patients is still alive and well. But again, it sets up another dilemma, because all of that time that they're spending working outside of the hospital is actually counted towards the duty hours.

Patient Safety

WEINSTEIN: What about the patient-safety impact of duty hours? There's a lot of literature on this. And I think it probably points in different directions, and there're certainly quite variable interpretations even of the same papers.

REYNOLDS: I actually feel like there are two safety issues. There's resident safety and there's patient safety. My take as a program director is that there are safety mandates on both sides of the duty-hours argument. That there are some studies that suggest that there have been no improvements in patient safety with the onset of duty hours, that we've transferred some of the errors away from things that we could measure before toward things like transitions in care. And that with the restriction of duty hours, there are many more handoffs. And that we may have been undercalculating the errors that occur with handoffs of quite ill patients from doctor to doctor.

In my own mind, I don't think that the patient-safety mandate has been borne out by the overall thrust of the literature over the past 10 years. I do think that resident safety is a good reason to think about limiting hours in various ways because there is, I think, good literature to suggest that fatigued residents are in more car accidents and have more personal harm as a result of their extended hours, which is a different matter than patient safety.

ARORA: The data on patient safety isn't as robust as I think people expected, likely because health care and patient care is a very complex system. And we did not actually — we put in a policy that we universally applied to all programs, regardless of specialty or PGY status, at the same time, at the same year. And so

that really limits our ability to really do elegant studies to look at whether or not limiting resident duty hours was actually a safe practice or not.

One of the reasons for that is that along the time that this happened, especially starting in 2003, we had already had the patient-safety movement, fueled by the IOM reports, so secular trends that could have led to more safe practices certainly could counteract any of the other findings we were seeing.

And in addition, because it's such a complex system, it's really hard in most of our hospitals to isolate care delivered to residents. And even in some of the largest studies that have been done by colleagues looking at billing data, there's very few billing codes that say this was a resident patient versus this is a hospitalist patient.. And so it's a very complicated issue to really tease out.

DROLET: There's the assumption that the residents are primarily responsible for the patients, when ultimately, the fact of the matter is it's always an attending who is responsible for the patients. I can't say from experience at what point that changed. Certainly, when you look at the Libby Zion case, which is supposedly the sentinel event in all of this, there were two residents there that were essentially unsupervised.

But since I've been a resident, the practice is always that, while you have some degree of graduated responsibility and autonomy, you're never acting solely in an autonomous fashion, or you should not be. And if you are, then that's part of what the Common Program Requirements have involved. They not only are focused on duty hours, but they focus on supervision. And so it's one of those confounding variables that's playing into what, if anything, is impacting patient care for positive, for negative, the supervision or the duty hours.

REYNOLDS: If we start out thinking that any system could possibly prevent any error from happening, that's not training. These people are learning to be physicians, and we have to expect that they'll make errors. And we have to create a system of redundancy or supervision so that the errors can be made and learned from without any harm to the patients.

And the supervision additions added in the 2011 duty-hour mandates are actually, I think, the best part of those 2011 rules, because they do spell out the fact that interns need to be supervised and the levels of supervision that are required at each stage, which I think is a really good thing.

Supervision

WEINSTEIN: Well, interestingly, supervision is very controversial in itself. And I know, particularly among surgical program directors, there's a lot of concern that the pendulum has swung too far and that a lack of independence or progressive independence is hurting surgical training. Some people point out that, I think, approximately 80% of surgical residents are now doing fellowships, and it's undermining the future of general surgery. And the blame is being placed, not so much on duty hours and reduced experience, but on the inability to get sufficient independent experience and thus get sufficient confidence to go into practice. As a surgeon, Brian, how do you react to that?

DROLET: When you look at what used to happen, at least according to my more senior residents or my attendings, is they used to operate by themselves in the operating room. But now the attending has to check the patient in, has to start the case, has to be there through the entire critical portion of the case, and has to end the case. And so that independence that you might have gained by operating independently, at least in the operating room, is no longer available because patients expect there to be an attending physician in the room, which is probably not unreasonable.

But when you're talking about lower-level procedures, things that interns or second-years might do, I think that the autonomy and the experience is still there, actually, because the seniors are afforded the responsibility of providing that supervision to the junior residents. And so they get to teach, and the junior residents still get to do the appropriate-level cases.

I think you can certainly take supervision too far. And it does detract from the learning experience if there's too much supervision. But supervision is probably what provides the greatest degree of patient safety because of the redundancy and the ability for someone who says, "You don't know enough to know that you're doing something wrong." And say, "This is how you actually do it." And that's how you learn and how you keep patients safe.

REYNOLDS: I think you can have too much supervision in any field. With the advent of hospital medicine within internal medicine, suddenly there are attending physicians present on the floor, sitting at the computer station next to the residents for the whole day, sometimes. And part of our job as educators is to create systems where we help the faculty learn what an appropriate level of supervision is and how to allow autonomy while still adequately supervising the care.

Handoffs

WEINSTEIN: Handoffs were a major concern, one of the areas that were identified right at the outset as possible negative unintended consequence for patient safety. Vinny, you've done some work in this area. Are we handling handoffs correctly?

ARORA: I would certainly say we've come a long way in handoffs. We still have a long way to go. And one of the things we've started to realize with handoffs is we can certainly teach the verbal communication and the written communication in order to have a proper handoff — and communication techniques and the idea that it's a professional responsibility to communicate well with your colleague.

Having said that, there are some system changes that we can make to actually ensure that there's some continuity with the patient. So there are handoffs where there's no common ground at all with the patient. Whereas if we can redesign shifts such that teams don't work and exit the hospital all at the same time, but we have overlap of the teams and somebody from the team is always present, you can actually raise the professional responsibility and there's a common ground — somebody knows the patient at all times in the hospital.

REYNOLDS: Although the irony is that a good handoff actually takes significant time, and so if you build in time at the beginning of a shift and at the end of a shift for good handoffs, the shift is getting shorter and shorter. And it's a struggle that we have around wanting the house staff to do very complete and comprehensive handoffs, looking at the amount of time they spend preparing for a day off in terms of the work that they do in advance of days off, it does compress even further the number of hours available in a shift.

I do think that we need to start investigating more electronic models of handoffs that don't require people to be spending time in the same place for a certain number of minutes per patient — although we're comfortable with that culturally and educationally. We have a new system with our emergency department where we have constructed a handoff tool that requires that the emergency department puts very specific information into a signout. And when a patient is ready to come up to the floor, the resident gets a page. And there is a very concrete signout filled out on the dashboard, explaining what's wrong with the patient and why they're being admitted. Vital signs have to be taken within 30 minutes. The residents were not excited about this method of handoffs. They wanted very much to be able to ask questions and push back. And it turns out that the quality of the signouts improved, because every field had to be filled out and they had to get

vital signs within 30 minutes, and so there were fewer patients crashing when they got to the floor.

And it's been a culture shift. But in that particular handoff, emergency room to medicine floor, the electronic tool has maybe been better than a verbal tool.

Financial and Educational Costs

WEINSTEIN: Let's think about the cost implications. That was a big concern back in 2003. It remains a big concern. Eileen, how is your institution addressing these cost pressures with respect to duty-hour limits?

REYNOLDS: I'm lucky to work in an institution that takes this really seriously, and we were actually relatively compliant already in 2003. And the changes for us in 2011 were not extraordinary, so for us the cost associated with the most recent changes has not been substantial.

We did start a hospital medicine service after 2003, where we have a large medical center and we have a geographically isolated area where general medicine patients are admitted. And the hospitalists cover those patients without house staff. That was done undoubtedly directly because of the 2003 limits but also, I think, has allowed us to offer really more innovative and novel programming for our residents. That service — I don't know what the current budget is, but when we had that service proposed back probably in 2004, it was already going to be sort of \$5 million opportunity for the medical center to provide non-house-staff coverage for doctors.

And each and every time that we're asked as program directors to comply with additional duty-hours mandates, there's an administrative burden to make the schedules that work and to create a system for monitoring and supervising this, as you know well, this system to make sure that we're compliant. There's an educational cost to make sure that everybody knows and understands what they should be doing when and how they should report and what to do if something's not working well. And then there's the additional cost of the human beings to cover the patients.

ARORA: If I would say that somebody from industrial engineering or human factors was taking a look carefully at our system, of what our first-year residents do in their training to become doctors and actually rate it — Is what they're doing necessary to their growth potential as a physician? — we'd find areas that we could actually take out of their shift. And there have been places that have tried

doing this — actually, many in surgery — where they've tried hiring even people like college students, premeds, or high school students to actually offload clerical work to these other labor pool and expose them a little bit to the medical career and leave and preserve the residents for the higher-level work that they need, that actually is instrumental to their growth.

WEINSTEIN: It begs the question that's raised periodically about whether the duration of training is going to have to increase, at least in some specialties, as a response to duty-hour limits.

DROLET: If you take a 5-year residency and make it a 6-year residency, when you're already talking about a 20% cut in direct GME funding, or even greater indirect GME funding — who's going to pay for an institution that's already 200 residents over the cap that now is going to have to train each one of their residents an extra year?

I think the hope is that with the Next Accreditation System and looking at residents in terms of competencies rather than years may change that. But it doesn't answer the question of what do you do with the resident who has not reached the competency yet, year 5, year 6, year 7.

But 10 years from now, what is going to be the impact if a surgeon 15 years ago did 1500 cases by the time they graduated and now they're doing 1200 cases? Is that going to be an impact for their future practice and their ability? Or in a more general field, say, pediatrics or internal medicine, where they see such a huge range of different patients? And if they want to be a general pediatrician or internal medicine physician how can someone learn in 3 years everything they need to know about a baby all the way up to 18 years old? That boggles my mind.

ARORA: Some people that think some of this is leading to increased specialization because of the idea that no one is comfortable at the end of their current residency with the general practice, and in any of our fields, because maybe they haven't been exposed enough. And so I know people are — surgical fellowships and fellowships in everything is definitely going up. And that has, obviously, policy implications when we have a primary care shortage.

Further Research

WEINSTEIN: There was a very good, I thought very good, Perspective in the *Journal* last year written by a couple of folks who recently completed training, asking the question of why we aren't doing more research to guide policy. Why

do you think there isn't more effective research happening, and what can we do to change that?

ARORA: Well, one challenge to doing research on this topic, and in terms of why there hasn't been more done, particularly around residency training, is, one, funding. It takes a lot of dollars to do an elegant sleep study and to really get a controlled trial and to monitor it.

And while some people have been successful at procuring funding, it's still challenging to run the study. And the reason for that is that it's a real-life study. It's not really a controlled research setting. And then multi-institutional studies are also challenging, because you can always argue, you can try to do one study here and one study there, and we have a lot of single-institutional studies. But context is everything. And so, you know, patient-safety culture, leadership, how the institution's financial health is, what their approach to using residents versus hospitalists versus mid-levels is — this would all change the outcome of any study.

And lastly, I think, the mandate is coming first. And the mandate is coming to the institution. When the mandate comes, the first question out of somebody's mind is not "Oh, how are we going to study it?" The first question is "How are we going to meet this and how are we going to make it happen?" And I hope that's changing, and I know there are some efforts under way to try to do that.

DROLET: It's such a multifactorial issue. And so if you think about what you'd have to do in order to do an intervention with residents where you change their shift structure, you either have to get an exemption from the ACGME so that, for example, interns could work more than 16 hours so you could compare that group, or you'd have to take a group that is allowed to work more than 16 hours and cut their hours down, which then requires that somebody else works those additional hours.

And in doing so, the group that's most likely to do that is going to be your attending physicians. And if you look at, nationally, there's been a shift of this responsibility from residents up to attendings. And if attendings are ultimately the ones responsible for the patients and for patient safety, what do you think is going to happen when you shift more resident time up to attendings and they begin to work more, if fatigue is really an issue?

The Future of Duty Hours

WEINSTEIN: What's the future of duty hours? Are we going to head in the direction of the European time-working directive of 48 hours a week? Or is the pendulum going to swing back toward looser regulation?

ARORA: It's hard to imagine that we are going to swing to a regulated mandate for everybody. And so the question then becomes, what does duty hours 2.0 or 3.0 look like? And I think a smarter version would include — certain things that you know that are affected by fatigue, like placing an arterial line. It takes sleepy resident four times longer to place an arterial line. I think we would all agree that you would not want a fatigued doctor to put in an arterial line. And in some cases, you don't really need the doctor that knows you to put in an arterial line. You really want the technically proficient one who's well rested. Whereas having an end-of-life conversation or doing a discharge — it's highly unlikely that a fatigued resident, unless they have narcolepsy, is going to fall asleep in the middle of actually giving you their discharge instructions. But familiarity is probably very important, and knowing the patient. And the handoff may be actually more of a vulnerability in those tasks.

So I would say if we start thinking about medical work like vigilance tasks that are susceptible to fatigue and then familiarity tasks that really could be susceptible to handoffs, we might see a pendulum that becomes more of a hybrid, where thinking about the technical work that the residents are doing, as well as the attendings.

DROLET: It seems to me that it's very difficult to imagine the pendulum swinging back. We recently completed a survey of about 500 patients at our institution. And the vast majority of patients said they would prefer a fresh doctor than the doctor who's worked 24 hours. And they said, about 80% said, that they would want to know if the physicians has worked more than 16 hours. And so the public perception remains the same.

If I had my way, I'd like to see flexibility. I don't see it going less hours or less restrictions, because of that ongoing public sentiment. But potentially the way around that is to provide greater flexibility in the sense that we're providing graduated levels of responsibility, that the educators are supervising residents adequately so that patients feel safe even with residents that have worked a longer period of time .

ARORA: We haven't done a good job of explaining to our patients what it is that we do. And the way this manifests is they do ask the question, "Why do I have to repeat my story so many times?" And so that question, even though they would prefer the well-rested doctor, implies to me that they are, that the continuity

element of understanding that having that one doctor who really followed you through that critical period of your first hours of admission and testing is important.

WEINSTEIN: So it sounds like what you're all recommending is, in order to refine the policy so that we get positive outcomes going forward, we have to educate the public. Maybe we can do a better job of that if we have data that really speaks to this issue and doesn't just look at hours as an isolated piece of a very complicated equation.