



BECOMING A PHYSICIAN

## An Elusive Balance — Residents' Work Hours and the Continuity of Care

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Four years after national limits on duty hours for medical residents took effect — and nearly two decades after similar limits were enacted by New York State — conversations with residency directors,

attending physicians, health care researchers, and sleep-medicine experts suggest that neither patient care nor medical education is optimal under the current system and that further reforms are needed. But there is little agreement on what should be done or even on whether the work-hour limits should be tightened or relaxed.

U.S. teaching hospitals are handling more admissions, treating older and sicker patients, and discharging patients more quickly than in past decades — factors that have intensified residents' workload, despite the limitations in hours. "We're looking at whether the current limits need refining," said Ingrid Philibert, sen-

ior vice president for field activities at the Accreditation Council for Graduate Medical Education (ACGME), which accredits U.S. residency programs. The ACGME is "being pushed from both sides," she says, "by folks who think we've gone too far and by those who think we've not gone far enough."

One reason is that there are no reliable national data measuring the effects of the work-hour limitations on training or patient care. The rules were intended to improve patient safety by reducing medical errors and to enhance residents' educational experience and protect them from accidents, injuries, and other consequences of sleep deprivation. Sleep-medi-

cine experts contend that U.S. residents still work too many hours — and that the currently permitted 30-hour shifts and 80-hour workweeks are unsafe for both doctors and patients. Residents in Europe work about 56 hours per week, and after August 2008, they will be allowed to work only 48 hours. Studies have documented that clinical performance suffers and errors increase when physicians are fatigued. "Twenty-four hours is too long" to be continuously on duty, said Steven Lockley of the Division of Sleep Medicine at Brigham and Women's Hospital in Boston. "You can only work appropriately for 16 to 18 hours."

There has been considerably less research, however, on whether preventable errors also increase when responsibility for patients is transferred repeatedly from one resident to another. Such "hand-offs" have become much more



frequent in teaching hospitals as a result of the scheduling changes made to comply with the work-hour rules (for example, the use of “night float” residents who admit patients during the night and pass them on to another team in the morning). At the University of California at San Francisco, for example, such changes in scheduling resulted in an average of 15 handoffs per patient during a 5-day hospitalization. Each intern was involved in more than 300 handoffs during an average month-long rotation, a 40% increase in the number reported before the duty-hour limits were in place.<sup>1</sup> With 6 million patients receiving care in U.S. teaching hospitals annually, the impact on medical care is potentially large — but difficult to measure.

As an attending physician supervising residents at Houston’s Michael E. DeBakey Veterans Affairs Medical Center, Laura Petersen, an associate professor of medicine at Baylor and one of the authors of a study showing that multiple handoffs increase errors,<sup>2</sup> said, “I’m really the only person who seems to have continuity with

the patients. . . . The residents are coming and going. . . . I know things are falling through the cracks.” Petersen and her colleagues published a follow-up study demonstrating that using a standard, computerized sign-out form to transmit key information about patients could prevent such errors,<sup>3</sup> but less than 5% of U.S. hospitals have adopted such procedures. In 2006, the Joint Commission, the accrediting body for hospitals, implemented a requirement that handoffs be standardized, and Philibert said the ACGME will probably address handoff procedures in a revision of its residency-accreditation requirements.

Nationally, there is no evidence to date that the duty-hour limits have had a measurable effect on preventable medical errors or on patients’ rates of death. Most research on the subject has consisted of small, single-site studies, lacking in statistical power. “Nobody at the ACGME expected a huge reduction in errors,” noted Philibert. “Residents are not the sole providers” of care, so their errors “may be caught by other

parts of the system.” On the other hand, sleep-medicine experts say that in general, new schedules have not shortened shifts or reduced fatigue enough to greatly improve residents’ clinical performance. A recent study surveyed 2737 residents at monthly intervals during their internship year about medical errors they had made; it found that the odds of reporting at least one fatigue-related clinically significant medical error increased by a factor of 7 during months in which they worked five or more overnight shifts, as compared with months in which they worked no overnight shifts.<sup>4</sup>

Kevin Volpp, an assistant professor of medicine and health care systems at the University of Pennsylvania, is conducting a large national study of patient outcomes that attempts to examine the impact of the rules, using data on millions of patients in the Medicare and Veterans Affairs systems. “We’re basically looking at the net effect of reduction in sleep deprivation versus reduction in continuity of care,” he said. “One of the big challenges is figuring out how to tease this apart and examine the tradeoffs.” Volpp said the evidence is compelling that assigning residents to shorter shifts reduces errors caused by fatigue. However, shortening residents’ shifts requires adding staff such as physician assistants, nurse practitioners, and hospitalists, and he noted that despite receiving Medicare subsidies for residency training, teaching hospitals operate on slim financial margins and have recently seen substantial reductions in Medicare funding. Considering the cost of fur-

ther reducing duty hours, Volpp asked, "Is this the best use of resources that could be targeted to reducing medical errors?"

At a recent meeting hosted by the Commonwealth Fund in New York City, physicians who supervise residents in the city's teaching hospitals said that the workloads of residents are higher than ever, which reduces the time available for education and adds to the clinical responsibilities of attending physicians and medical students. "On our medical service, the average age of patients is over 80," said Andrew Yacht, program director of the internal medicine residency program at Maimonides Medical Center in Brooklyn. "Over 20% of our medicine beds are occupied by ventilator patients." Residents "are stretched way too thin. . . . They're just trying to tread water." Patients suffer when responsibility for their care shifts repeatedly from one resident team to another, said Abigail Zuger, an attending physician at St. Luke's–Roosevelt Hospital Center in New York. "It's a misery for them — they don't know who is in charge of their case. They see an endless parade of strangers," she said.

In trying to mold residents' schedules to the new rules, program administrators "have come up with solutions that are not best for patient care nor best for fatigue," said sleep expert Lockley, whose team is creating software programs to help residency directors predict the effects of various schedules on sleep time and alertness. The fact that attending physicians usually meet with residents to hear about new patients only once a day "is what's really driving the 24-hour

shift," Lockley added; twice-daily attending rounds would facilitate shorter shifts. How to devise schedules to reduce fatigue and improve education and continuity of care "is probably the most interesting question right now," agreed Kathlyn Fletcher, an assistant professor of general internal medicine at the Medical College of Wisconsin in Milwaukee, who has studied the effects of schedule changes. Fletcher believes that the work-hour rules are "only going to get more stringent."

To create training programs that deliver safe and excellent patient care, high-quality medical education, and sufficient sleep for residents, residency directors will need to implement far-reaching reforms to reduce workload intensity and to impart professional standards that emphasize working as a team, said Ethan Fried, vice chair for education at St. Luke's–Roosevelt Hospital Center. "You absolutely, positively need to have duty hours . . . [but] it's duty hours in concert with a much more highly developed system for teamwork and for passing work along — which we're really still struggling to develop," he said. "We're looking at ways to reduce caps [the maximum number of patients cared for by one intern] and ways to fund the faculty to supervise the handoff process, but all this is work — real work that needs to be supported and paid for."

Philibert said the ACGME wants to collect feedback and data to help it decide how to "refine" the current duty-hour rules and is encouraging residency programs to submit proposals for pilot projects to study the effects of innovative sched-

ules and other changes. There is no funding available, but in exchange for conducting approved pilot projects, programs could receive incentives such as accreditation waivers (exemption from certain requirements or extension of accreditation beyond 5 years), she said. Some pilot projects are expected to start this July, and results may be available by the middle of next year.

The biggest challenge, according to several observers, is teaching residents that their conscientiousness is best expressed by ensuring that their patients will be well cared for by colleagues while they are off duty, rather than by working to exhaustion. "That is a big challenge to the profession," said Carolyn Clancy, director of the federal Agency for Healthcare Research and Quality. "I think it has to be addressed head on, and it's a much larger question than how many hours are enough — or too much."

**An interview with Ethan Fried of St. Luke's–Roosevelt Hospital Center can be heard at [www.nejm.org](http://www.nejm.org).**

Dr. Okie is a contributing editor of the *Journal*.

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