

Limiting shifts for medical trainees affects satisfaction, but not educational outcomes

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Limiting first-year medical residents to 16-hour work shifts, compared to "flexing" them to allow for some longer shifts, generally makes residents more satisfied with their training and work-life balance, but

their training directors more dissatisfied with curtailed educational opportunities. That's one conclusion of a new study published online March 20 in the *New England Journal of Medicine*.

For the study, part of a five year effort funded by the National Heart, Lung and Blood Institute and the Accreditation Council for Graduate Medical Education (ACGME) and led by the Perelman School of Medicine at the University of Pennsylvania in close collaboration with The Johns Hopkins University, the investigators surveyed and tracked the activities of thousands of first-year residents—or interns—in 63 internal medicine training programs nationwide. The findings also found that shift-length regulations have no impact on interns' activity or test of medical knowledge scores one way or the other.

"The effects of limiting trainee duty hours were not known," says Sanjay Desai, M.D., associate professor of medicine and director of the Osler Medical Training Program at the Johns Hopkins University School of Medicine. "A randomized trial with many institutions and generalizable findings was needed to inform the issue," he adds.

Until the early 2000s, training program guidelines and regulations generally had no limits on shift lengths for doctors-in-training, leading many residents to work upwards of 90 hours a week, with shifts as long as 36 hours. Training directors often justified the long hours as a way to prepare physicians for a lifetime of learning and treating patients successfully under pressure and often with little sleep. They also pointed to the need for continuity of care, made more difficult by frequent shift changes.

In 2003, however, the ACGME first set regulations based on expert opinion—30-hour maximum shifts and 80-hour maximum workweeks—for all accredited residency programs in the U.S.

Despite a series of observational studies that showed no difference in the quality of patient care with those stricter limits, even more stringent regulations were put forward in 2011—limiting interns to 16-hour shifts and more senior residents to 28-hour shifts. These new limits increased controversy, with many training directors arguing that junior clinicians needed to follow patients for longer continuous periods to really learn how to care for them.

"Many educators have worried that the shift work created by limited duty hours will undermine the training and socialization of young physicians," says the study's principal investigator David Asch, M.D., John Morgan Professor of Medicine at the Perelman School of Medicine at the University of Pennsylvania. "Educating young physicians is critically important to health care, but it isn't the only thing that matters. We didn't find important differences in education outcomes, but we still await results about the sleep interns receive and the safety of patients under their care."

The researchers note that while advocates for duty hour limits have worried that long shifts can lead to fatigue and fatigue can cause errors, short shifts mean more handoffs of care and handoffs can also cause errors. "We created this study to simultaneously evaluate the effect of alternative duty hour policies on resident education, resident sleep and alertness, and patient safety. The part of this study being reported in the March 20 issue of the *New England Journal of Medicine* is about [medical education](#). It will be essential to see the rest of the data before we know where to go next," says Asch. He expects those results to be available by early 2019.

The individualized comparative effectiveness of models optimizing patient safety and resident education (iCOMPARE) study analyzed 63 internal medicine residency programs at large hospitals around the U.S. Each of the programs was randomly assigned to either the 2011 limited-

hour policies (16-hour shifts for interns, at least eight hours off between shifts with 80-hour weekly work maximums and one day off in seven days) or were permitted to use a more flexible set of rules requiring only the 80-hour weekly maximums and one day off every seven days. The programs were examined from July 2015 through June 2016.

As part of the study, 23 trained research observers followed the daily routines of a total of 80 interns—44 with flexible-hour programs and 36 in limited-hour programs. They found that the percent of time spent on direct patient care, as well as the time spent on education, was statistically the same in both program types: 12 to 13 percent on face-to-face patient care and 7 percent on education.

Scores on a national in-training exam that helps gauge medical knowledge in the second year of residency also showed no difference between interns in the two arms of the study, when adjusted for baseline scores in the programs. Among 1,687 second-year residents in the study programs in 2016, average scores were 68.9 percent in flexible programs and 69.4 percent in limited-hour programs.

When more than 1,200 interns from the 63 training programs who participated in the study were surveyed at the conclusion of the study period, interns in the flexible-hour programs were more than twice as likely to report dissatisfaction with their overall well-being, their schedules and their time available to rest, and about one and a half times more likely to report dissatisfaction with the overall quality of their education. Levels of reported burnout were roughly the same between the groups, with 79 percent of interns in flexible programs and 72 percent of interns in limited-hour programs scoring moderate or high on the Maslach Burnout Inventory emotional exhaustion scale, based on answers to a questionnaire.

Conversely, when 62 program directors of the participating programs

were surveyed at the conclusion of the study, directors of flexible-hour programs were less likely to report dissatisfaction with various aspects of the learning environment. For example, none of the program directors in flexible-hour programs were dissatisfied with the ability of interns to manage the patients they admit and to effectively perform clinical duties; 13 percent and 10 percent of the program directors in limited-hour programs had concerns in these areas, respectively. Additionally, standard-hour program directors were nearly 20 times more likely to be dissatisfied with the ability of attending doctors to give real-time feedback to interns, 10 times more likely to be dissatisfied with the frequency of patient handoffs, and more than four times as likely to be dissatisfied with opportunities for bedside teaching.

"The takeaway is that interns were overall less satisfied with the flexible policies and the program directors were less satisfied with the standard approach," says Judy Shea, Ph.D., professor of medicine and associate dean of medical education research at the Perelman School of Medicine at the University of Pennsylvania, and the study's senior author. "The lenses of teachers and trainees are different, though both provide an image of how medical training should be seen."

The team is still awaiting further data from the iCOMPARE study examining patient mortality and other clinical outcomes in the 63 involved hospitals, as well as [interns'](#) sleep patterns and scores of tests of their alertness—one measure of sleep deprivation.

Until then, Desai says, wise program directors need to create "a far more collaborative process for making schedules than has been used in the past." Asch adds: "The residents are telling us something and program directors should listen carefully."

Provided by Johns Hopkins University School of Medicine

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