

IN TRAINING: PART II

Residency Work-hour Changes: A Resident Perspective on Resultant Challenges and Opportunities

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The 2011 Accreditation Council for Graduate Medical Education (ACGME) guidelines for resident work-hours reduced the maximum number of uninterrupted hours that an intern can work to 16 hours and required eight hours between shifts.¹ This resulted in dramatic changes in resident schedules, with commensurate impacts on staffing of teams, teaching by attending physicians, clinical exposure for learners, coordination of patient care by support staff, and transitions of care. Despite good intentions, the work-hour changes have been met with significant criticism. Two studies, both recently published in *JAMA*, describe how changes to work-hour restrictions have failed to improve both patient outcomes² and resident examination performance.³ Studies have also shown that work-hour changes have not improved residents' perceptions of their training. Despite these and other unforeseen challenges, the changes to resident work hours do more closely align with some aspects of real-world practice. Furthermore, it is unlikely that the work-hour restrictions will be changed again in the near future. Therefore, in the era of work-hour restrictions, we require new approaches that provide trainees the highest level of education. I offer a resident-centric perspective on the impact of these changes on residency training and identify potential targets for improvement.

Night-float Rotations

One of the greatest effects of the change to work-hour limits has been on the logistical aspects of medical training, including residents' schedules, staffing, and transitions of patient care. This has been most

apparent through the creation of night-float rotations. Because 24-hour shifts have been abandoned, shift-work scheduling has emerged to replace the traditional rotating (every three or four days) full-day call system. Programs have adapted by creating night-float rotations, resulting in both positive and negative effects.

First, residency programs must use increased numbers of residents to cover the same service; subsequently, the availability of residents to cover all the clinical services has decreased within residency programs. At our institution, this has resulted in less flexibility in scheduling electives, educational time, and vacations. Additionally, we have had to increase the amount of jeopardy coverage throughout the year.

Second, night-float coverage increases the frequency of handoffs that occur between covering teams. Handoffs have been identified as particular opportunities for medical errors and challenges for patient safety.⁴ In addition to creating room for errors, increased handoffs changed residents' time distribution throughout the workday. Fletcher et al. previously described how much of residents' time during shifts is spent away from direct patient care, including increased time for documentation and sign-outs.⁵ Increasing the number of handoffs contributes to this trend, as residents' time is spent preparing sign-out documents and discussing patient care with covering night-float providers. At our institution, with multiple teams waiting to sign-out to night-float providers, the sign-out process can take more than an hour.

Third, night-float rotations have affected teaching and clinical exposure. Fewer attending physicians are pre-

sent at night than during the day, which limits the amount of resident and intern contact with instructors. Some programs with particularly busy night shifts have elected to create swing rotations in which residents cover only the evening period when admissions tend to be heaviest. Depending on the program, admitted patients may subsequently be staffed by different residents than the resident who admitted the patient—a process known as hold-over admissions.⁶ Through decreased contact with attending physicians, hold-over admissions increase resident autonomy but also reduce the opportunity for feedback. This system, while efficient, opens the door for learning gaps. For example, positive disregard bias is a cognitive error in which actions performed without reinforcement are assumed to be correct. If a resident admits a patient but does not follow the patient, the outcomes of the resident's clinical decisions may never be relayed, resulting in the presumption by that resident (whether right or wrong) that clinical decisions were indeed correct.

Fourth, in addition to changing the admission process, night-float rotations allow residents to gain cross-cover experience. At our institution, residents cross-cover between 40 and 80 patients on multiple services. Caring for this number of diverse patients exposes residents to many varied situations and demands development of time-management and triage skills.

Fifth, because residents no longer stay for 24 hours and "handoff" their patients to night-float coverage, it has been argued that reducing residents' time in the hospital limits the ability to observe the course of an ill-

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ness and the consequences of any given treatment plan.⁷ For the most common conditions, however, it is likely that by working different shifts, these learning experiences will still be present, albeit more fragmented.

Finally, as a result of traditional daytime coverage and expanded nighttime cross-coverage, more providers are caring for each patient. Attending physicians therefore must rethink teaching strategies and prepare for contact with increased numbers of learners for each patient.

Impact on Patients and Other Care Providers

In addition to affecting residency programs, learners, and attendings, changes in resident work hours have impacted patients and other hospital providers. First, patient care is more fragmented. Patients are now exposed to multiple providers including daytime providers, nighttime cross-cover providers, and (depending on the time of their admission) admitting providers. This can make it difficult for patients to identify their primary care team and recognize where to direct their questions.

As we increase the number of people caring for each patient, nurses and technicians experience more difficulty in identifying whom to contact with questions and alerts. With night-float cross-coverage, contact information for providers changes. This is particularly impactful for nurses when the need to provide clinical status updates or request new orders arises. Contact phone or pager numbers may change abruptly for a call at 5:55 followed by a call at 6:01. This can affect work flow in emergency, radiology, and laboratory departments resulting in uncertainty

regarding whom to call for admissions and to report critical findings. While coverage schedules are often published, at many institutions these schedules are not updated in real time and fail to identify the actual person to call at critical moments in patient care.

Opportunities for Improvement

The challenges that accompany work-hour changes present exciting opportunities for innovation. Transitions are a vulnerable time for patient care and require new methods to improve patient safety. It is important that trainees learn how to properly give and receive patient sign-outs, as this is a critical skill for future clinical practice. As recently published by Starmer et al., residency programs have not only impacted learning and handoff structure but have also improved patient care by instituting structured handoff procedures.⁸ Additionally, some residency programs have adapted to staffing changes by developing standardized feedback tools that facilitate attending physicians' communication with residents on night-float rotations.⁹ Finally, to help mitigate the problem of whom to call for active patient issues, electronic resources that assist in the identification of care-team members, such as Amion (© 1999-2014 Spiral Software), have been developed.

Despite these improvements, more is needed: Standardized feedback from daytime providers to night-float residents is still lacking, directories with contact information are not updated in real time, and cross-cover decisions are often made in isolation by interns who receive infrequent feedback on their errors and successes.

Conclusion

Changes included in the 2011 ACGME work-hour policies have influenced many aspects of medical residency and changed the care patients receive. Ultimately, the changes in residency duty hours more accurately reflect the realities of inpatient care in the community with increased shift-work and more shared responsibility for hospitalized patients. To prepare trainees to be competent and confident providers at the time of graduation, residency training should reflect real-world practice. Creative solutions that foster active learning environments to prepare residents for independent clinical practice are needed.

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