Changing the Formula of Residents' Work Hours in Internal Medicine: Moving From "Years in Training" to "Hours in Training"

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Abstract

Background In a recent report, the Institute of Medicine recommended more restrictions on residents' working hours. Several problems exist with a system that places a weekly limit on resident duty hours: (1) it assumes the presence of a linear relationship between hours of work and patient safety; (2) it fails to consider differences in intensity among programs; and (3) it does not address increases in the scientific content of medicine, and it places the burden of enforcing the duty hour limits on the Accreditation Council for Graduate Medical Education.

Proposal An innovative method of calculating credit hours for graduate medical education would shift the focus from "years of residency" to "hours of residency." For example, internal medicine residents would be requested to spend 8640 hours of total training hours (assuming 60 hours per week for 48 weeks annually) instead of the traditional 3 years. This method of counting training hours is used by other professions, such as the Intern Development Program of the National Council of Architectural Registration Boards. The proposed approach would allow residents and program directors to pace training based on individual capabilities. Standards for resident education should include the average number of patients treated in each setting (inpatient or outpatient). A possible set of "multipliers" based on these parameters, and possibly others such as resident evaluation, is devised to calculate the "final adjusted accredited hours" that count toward graduation.

Anticipated Benefits Substituting "years of training" with "hours of training" may resolve many of the concerns with the current residency education model, as well as adapt to the demands of residents' personal lives. It also may allow residents to pace their training according to their capabilities and learning styles, and contribute to reflective learning and better quality education.

Introduction

In its recent report, the Institute of Medicine (IOM) recommended more restrictions on residents' working hours.[1] These recommendations were developed to address concerns about preventable medical errors and to improve patients' saftey.[2] The Accreditation Council for Graduate Medical Education (ACGME) has revised its duty hour standards, in part to conform with the IOM report, and the final standards were approved in September 2010.[3]

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The views expressed herein are those of the author and do not reflect the official policy or position of Brooke Army Medical Center, the US Army Medical Department, the US Army Office of the Surgeon General, the Department of the Army, Department of Defense, or the US Government.

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Challenges With the Current System

Several problems exist with the current or the proposed limitations on resident duty hours. First, they assume uniformity of intensity or "hardship" among different residency programs. Significant variability exists among different residency programs.[4] A 16-hour shift in a busy, urban institution serving large numbers of economically disadvantaged patients and facing financial challenges is different from a 16-hour shift in well-staffed medical center. Although comparative studies are lacking, it is possible that limiting hours in the first setting is important for patient and resident safety, with support for this coming from recorded events surrounding the death of Libby Zion.[5] In contrast, in the second setting, a 16-hour shift may not enhance patient safety but impair resident learning.

Second, they assume that there is a linear relationship between hours of work and patient safety: the shorter the hours of work, the safer the patients. To date, no studies have established such a linear relationship. In a prospective observational trial in 2 internal medicine units at an academic medical center, orders written by residents were

evaluated daily. A total of 45 366 orders, including medication orders, diagnostic procedures, and nursing care, were reviewed. The number of hours worked by internal medicine residents during a 24-hour shift did not appear to affect the frequency or significance of errors.[6] Moreover, although surgical specialty residents are reported to work the most hours per week,[7,8] duty hour limitation was associated with improvement in mortality for medical but not surgical patients.[2] Mortality is not a perfect measure for patients' safety, because medical errors encompass a wide spectrum of harms, but these data may indicate that the relation between duty hours and patient safety is not a simple, linear one.

Third, the IOM report does not address how to handle the rapid growth in the scientific content of medicine as duty hours are being reduced. The breadth of internal medicine has dramatically increased.[9] As appropriately stated by some educators, "there is simply insufficient time to educate internal medicine residents in 3 years."[10]

Fourth, the IOM report put the burden of enforcing the recommendations on the ACGME. Lack of adherence along with underreporting resident hours has been long reported in some studies.[11]

The Proposed Solution

Internal medicine residency education has been linked to "years" of training, which became increasingly full with duties, courses, and scholarly activities. Other professional organizations use an "hours" of training model rather than a set number of years. This allows trainees to progress at their own pace and according to their capabilities and their training organization's plans. The flexibility eliminated any need for regulatory bodies to interfere with rules for limiting training hours. For example, the Intern Development Program of the National Council of Architectural Registration Boards requires graduate trainees seeking certification to spend 5600 hours in supervised training in units of either full-time or part-time employment. There are specific conditions of duration of employment, qualifications of the supervisors, and details regarding how the hours should be spent among the different architectural practice disciplines.[12] In internal medicine, residency education may require 8640 hours of total training hours (assuming 60 hours per week for 48 weeks annually). The exact number of hours likely will be debated, and may differ among various disciplines of medicine. For example, translating the current ACGME requirements for internal medicine into "hours of training" would equal a minimum of 3500 hours as inpatient experience (currently, ACGME requirements for internal medicine stipulate that one third of residency training must be spent as inpatient experience, which traditionally includes extended work shifts), and 2880 hours as outpatient (current ACGME requirements call for one-third of residency training to be spent in ambulatory experiences, which traditionally include regular hours and less frequent shift work); 40% of the inpatient time may be required as shift work, as well as a specific number of hours in different medical subspecialties. Panels of experts could propose further categories, such as number of hours spent attending didactic lectures and conducting scholarly activity, and number of yearly resident-hour products for which an institution is accredited. The program director may decide to "slow down" the "hours" of a resident who is having trouble adapting, or expedite the course of a fast learner. Standards of residency training should also include the average number of patients treated in inpatient and outpatient settings based on the rate of admissions and outpatient clinic visit for each institution. A possible set of "multipliers" based on these parameters, as well as resident evaluations, is devised to calculate the "final adjusted accredited hours" that count toward graduation. Accordingly, residents in hospitals with low patient volume may need an extended period of training to acquire their hours of residency for graduation. For example, internal medicine residency programs at present are required to demonstrate a minimum of 210 admissions per year to the medical teaching services for each first-year resident; such a program might be given a multiplier of 0.95, whereas a program with a rate more than 250 admissions per year would receive a multiplier of 1. This approach may be specifically advantageous to surgical training because high-volume surgical centers have been shown to have better outcomes than lower-volume centers, and it might be plausibly argued to be associated with differences in opportunities of training.[13,14] Experts in each medical field may define what high volume and low volume would be, as well as the magnitude of the multipliers for these parameters. This approach would enable residents and program directors to pace the training based on individual capabilities and institute demands within maximum and minimum rates to avoid both extremes: the extreme compression of training time, resulting in exhaustion, or the extreme prolongation of training time.

Recent theories of acquisition of professional skills center around the importance of deliberate practice for a large, but not excessive, number of hours of training.[15,16] Deliberate practice is defined as activities that are designed to improve level of performance, with immediate informative feedback and knowledge of results of the performance.[15] Whereas the quality of the deliberate training is important, ensuring adequate "hours" of training is necessary for skills acquisition.[15,16] Using "hours of training" instead of "years of training" encompasses flexibility that is highly needed to allow for reflective learning based on individual capabilities. Reflective learning means deliberate recall and review of an event, typically an event in which the learner has been active, and requires that learning occur at a controlled pace.[17] It is not simply "years" spent at work, but how residents learn during that training.

Substituting "years of training" with "hours of training" can resolve many of the IOM's concerns and ACGME standards, and adapt to the individuality and personal life pressures of many residents, eliminating the need for "policing" training programs.

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