

CHAPTER 3 THE 2003 COMMON STANDARDS AND THEIR EFFECT

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Background

In late 2001, when the ACGME Work Group on Resident Duty Hours and the Learning Environment began deliberations on common standards limiting resident duty hours, studies, editorials, and commentaries discussed the effect of sleep deprivation in residents on patient safety, resident safety, and resident learning and well-being. The individual Residency Review Committees had developed and enforced established specialty-specific duty hour limits, and the ACGME had established a few common duty hour standards that applied to all accredited programs.

The decision to set common duty hour standards for all accredited specialties and subspecialties was prompted by 3 factors: 1) changes in the delivery system, including increased patient acuity and intensity of service; 2) research showing negative effects of sleep loss on performance; and 3) public attention on resident work hours.¹ Independent research on resident hours and those worked by practicing physicians showed that resident hours increased between 1996 and 2000, after being steady between 1982 and 1985.² A contributing factor may have been the introduction of caps on institutional resident complement as a consequence of the

Balanced Budget Act of 1996.³ In late 2001, growing focus on the hours worked by residents culminated in the introduction of legislation to limit resident hours and a petition to regulate duty hours as a workplace health hazard.^{4–6} This prompted concern that lack of action on the part of the ACGME might be interpreted as the profession ignoring public opinion and the scientific evidence on sleep and performance.

The Work Group set out to develop standards as part of a comprehensive program to address resident duty hours that would include standards that promote safe care, resident learning, and well-being; consistent enforcement at the program and institutional level; and education of residents and faculty about sleep loss and its effect on performance and learning. The effort was sensitive to differences among specialties. At the same time, it was important that the proposed standards be easily explained and viewed as comparable to the perceived “safety and effectiveness” of a legislative or regulatory approach.

The dialogue with the academic community and the public highlighted a gulf between the 2 stakeholder groups, and the Work Group developed 2 guiding principles to bridge the differing perceptions: (1) sensitivity to education and patient care needs of the 26 ACGME-accredited specialties and (2) a need for the standards to reflect the science on sleep loss and performance. This led to the development of common standards that were flexible and sensitive to specialties, programs, and residents, while allowing the ACGME to make the case for public accountability by having all residents under a comparable limit.

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The ACGME 2003 Standards

In the summer of 2002, ACGME granted preliminary approval to common duty hour limits that became effective in July 2003. In 1992 the ACGME adopted limits for all specialties, which became part of the current duty hour standards, including in-house call no more frequently than every third night and 1 day in 7 free of all program responsibilities. These standards were enforced before 2003, and 6 specialties established a weekly duty hour limit.

Advances in the scientific study of sleep deprivation generated evidence relevant to residents' clinical and educational performance, including meta-analyses that showed sleep deprivation negatively influenced performance in controlled experiments and in clinical studies involving residents.⁷⁻⁹ This supported a limit on continuous duty hours, to avoid acute sleep loss, and a limit on weekly hours and provisions for intermittent rest to avoid chronic, progressive sleep debt. The Work Group's deliberations about optimal standards highlighted tensions between the benefits of shorter hours, which would render residents more alert and able to learn, and the need for time and exposure to patients for the significant amount of learning that needs to occur during residency. It also showed that there was (and still is) little scientific guidance for the number of weekly and continuous hours at which residents safely and effectively learn and participate in patient care. The new standards needed to balance the strengths of a common approach, as perceived by legislators and the public, and its limitations, given differences among specialties in patient care and educational processes. The Work Group chose 80 weekly hours as the upper limit to safeguard against chronic sleep loss, and a 24-hour limit on continuous duty to mitigate acute sleep deprivation.¹ Both were selected because they allowed residents to participate meaningfully in care and to gain an understanding of the dedication expected from physicians, while allowing them to be reasonably rested and alert.^{10,11} The added period of up to 6 hours after overnight call preserved flexibility in scheduling

didactic activities, minimized exclusion of postcall residents from educational programming, and avoided residents going home at the time of their circadian nadir.^{10,11}

The Work Group emphasized both the strengths of a common set of standards for assuring legislators and the public, and the limitations of this approach, given interspecialty differences in patient care and educational processes and individual differences in the response to sleep loss. The Group considered a narrow focus on hours alone an imperfect approach, and the standards emphasized educational content—an approach that reflected the longer hours of physicians in practice—and safe patient care by emphasizing that residents and faculty collectively have responsibility. The Work Group was aware that concerns emanating from New York State's experience with state regulation included high costs¹² and evidence that it did not appear to improve patient care.^{13,14}

The 2003 common duty hour standards represented a compromise between the need for specificity and the desire to allow some flexibility to benefit education and patient care. They allowed RRCs such as Emergency Medicine and Anesthesiology to maintain different requirements that accommodate patient care, safety, and education needs within the specialty. In 2003, when the community faced a threat of legislated limits on resident hours, it was important to create common standards, while emphasizing that accreditation offers greater flexibility and sensitivity to specialty considerations than regulatory or legislative approaches.

Experience With the 2003 Common Duty Hour Standards

The Work Group recognized that duty hours, attributes of the learning environment, and curricula and education models were linked and expected that implementation of the new standards would be accompanied by changes in the delivery and educational systems. In the more than 7 years since the 2003 implementation of the standards, programs and

institutions have made changes in resident education and patient care activities and in the mechanisms for duty hour monitoring and oversight. Many programs used night float and other schedule changes to adapt hours to the common limits, while others replaced resident services with mid-level practitioners or hospitalists, and a few reengineered their patient care and education systems. Virtually all increased the clinical responsibilities of faculty physicians.

Ideally, information about the effects of limits would be gathered in prospective studies showing a negative effect of long hours on the clinical performance of physicians after residency and in the settings where residents participate in care. This information does not exist. Studies predominantly consisted of opinion surveys, single-site studies without the power to demonstrate effect, and analyses of secondary data that show associations but cannot establish cause and effect. Speculation on the effect of the limits included overstatements of their negative effect on learning, based on faculty perceptions of “inadequate clinical experience,” and disappointment arising from unrealistic expectations that the limits would produce an immediate, profound improvement on the quality and safety of patient care.

Effect on Resident Professionalism

In many specialties, implementation of the common limits reduced resident fatigue, improved well-being, and contributed to an improved balance between residents’ professional and personal lives. One concern was that the limits would contribute to a loss in professionalism, with residents comfortable working in hourly settings but unfamiliar with the obligations physicians have to their patients.¹⁵ Paradoxically, supporters of regulating duty hours argued that excess hours also diminished resident professionalism, contributing to cynicism, indifference, and hostility toward patients, and suboptimal care.^{16,17} A study of resident perceptions of New York State’s duty

hour regulations showed ambivalence about the effects of limits on professionalism. Residents experienced the limits as “an open-ended workday and competing considerations—including concerns about leaving patients at critical junctures in their care, regard for the workload of their colleagues, and uneasiness about the educational consequences.”¹⁸

Faculty perceptions about diminished resident professionalism often appear tied to a traditional view that emphasizes physicians’ continuous availability to their patients. At the same time, established definitions of professionalism that emphasize altruism and self-effacement do not equate these attributes with an unlimited number of hours devoted to patient care.^{19,20} One predicament of the current cohort of residents is their need to deal with the unstated, perhaps unconscious, expectations of faculty, program leaders, and administrators. If residents leave too early, it is seen as a lack of the professionalism and dedication exhibited by prior cohorts. If they linger, they are viewed as inefficient and a threat to compliance. Interviews and commentaries suggest that residents’ decisions to remain at work or go home are more sophisticated and influenced by a number of factors, including the extent a given activity is viewed as educationally valuable or essential to a good patient outcome (eg, transitioning a patient to the intensive care unit versus paper work to arrange for home delivery of oxygen).²¹ Another study found that residents on occasion stay to complete patient care tasks when they should leave because of the organizational emphasis on thoroughness, and to think carefully about the tradeoffs inherent in the standards and other educational and patient care considerations important to them.²²

Effect on Acquisition of Clinical Skills

Research and commentaries on the effect of the work limits on clinical skills’ acquisition suggest that the effect varies by specialty. One reason is that when data on the effect of the limits are disaggregated by specialty, several patterns emerge. First, in a number of specialties, such

as dermatology, psychiatry, radiology, and preventive medicine, weekly duty hours did not reach any of the common limits, and in other disciplines, only selected months in inpatient and intensive care unit rotations were affected. In contrast, the surgical community expressed concerns that an unintended consequence of the limits could be reduced operative skills for surgeons trained under the limits, especially during the early period following implementation, when clinical and education systems were still adapting. One reason is that surgical disciplines have traditionally worked the longest hours and made the largest adjustments. Another is that the extent to which reductions in resident hours may have curtailed activities vital to the professional development is greater in procedural disciplines. Residents in medical disciplines can use the added time for self-study and reflection (although informal evidence suggests that time devoted to self-study has not increased under the 2003 limits), but the common duty hour standards restrict surgical residents' time for operative experience, the activity potentially most relevant to the development of surgical skills. In addition to a sizable number of commentaries warning about declining skills in graduates of surgery and surgical specialty programs, recent research²³ has found that the skills of recent graduates may be lower than those of earlier cohorts.

Contrasting learning opportunities for medical and surgical specialties does not suggest that procedural skills are irrelevant in nonsurgical disciplines, or that surgical residents do not learn from reading. Instead, clinical learning is about acquiring the accepted knowledge, skills, and attitudes of the domain. Informal evidence suggests that bedside and clinical learning is important in a range of specialties and that pediatric residents in programs with more hours and months of clinical learning perform better on the board certification examination (J. Gilhooly, MD, verbal communication, May 2009). Acquisition of clinical skills requires practice and benefits from opportunities to apply new skills

under supervision and guidance from faculty or more advanced learners.

There probably are added effects of the duty hour limits on medical students' and junior residents' education owing to the diminished hours available for senior residents under the limits. A study in New York found that this may exacerbate existing conflict in residents' role as teachers, including their learning needs conflicting with those of students and junior residents; this suggests that residents' first priority is to address the medical needs of patients, and the learning needs of junior learners may be secondary.²⁴

Effect on Quality and Safety of Care

One reason for the public demand for duty hour limits in the United States was to reduce excessive duty hours and fatigue as potential performance-shaping factors and contributing causes in health care errors. Residents function in a health care system in which the financial and human costs of errors are significant. In their role as learners, with short tenure, and lack of familiarity with settings, residents may be more vulnerable to errors. Systems approaches to reduce the sources of errors have emerged as fertile interventions to enhance safety. Limits on work hours, to some extent, fit within these interventions because they address the effects of sleep loss, which may add to residents' vulnerability.

While some studies of the effect of duty hour regulations in New York State reported improved patient care, a larger number found fragmentation and reduced continuity, reduced actual or perceived quality of care, and higher rates of complications.^{13,14,25} Studies of the effect of the common duty hour limits at the national level, despite large sample sizes, found little change in patient mortality during the 2 years following the implementation of the ACGME common duty hour standards.²⁶⁻³¹ Reductions in in-hospital mortality for Medicare beneficiaries and patients receiving care in Department of Veterans Affairs hospitals was not associated with hospitals' teaching status, suggesting that other factors accounted for this

improvement and that the duty hour limits did not net positive or negative association of the resident work hour regulations with a major patient-centered outcome.

Effect on Resident Well-Being

Resident well-being and an improved balance between residents' professional and personal lives is one area where the body of literature on the effects of common duty hour limits has produced relatively unequivocally positive findings. At the same time, there is evidence that residents work harder in the hours shortened by regulatory limits, and residents now appear to be more concerned with the intensity of their workload than with the number of hours worked. There are indications that resident work has not diminished proportionately to the reductions in hours and that work intensity has increased. One reason is that financial pressures force many hospitals to largely preserve residents' contribution to patient care.³² This may contribute to upsetting a balance between service and education, with fewer elective rotations, less formal didactic activities, and a feeling there is less time for resident learning at the bedside, in the clinic, and particularly the operating room, where opportunity to observe and assist in procedures before performing them under supervision is becoming the exception rather than the norm. There are fewer senior residents who are available to teach and mentor junior residents and students, and to benefit themselves from participation in this time-honored process of education in the profession.

During the early implementation of the 2003 duty hour standards, some residents reacted negatively to interventions that reduce time they considered important for their learning and professional development. Initial informal data suggested that the coexistence of duty hour limits and an overarching focus on meeting clinical demands for some residents might contribute to their viewing themselves as workers and championing reductions in hours, whether they are applied to educationally valuable time or hours used to meet service demands.

Reducing Hours

In most programs, reducing resident hours required that some patient care activities be transferred to other providers, and the complexity and challenges posed by these transfers merits further attention. Transferring work to faculty and other providers is made difficult because of shortages in many health professions and because faculty already feel overburdened. Replacement is complicated by the fact that most mid-level practitioners cannot perform the full range of activities that can be performed by a physician.³³ Efforts to redesign care in teaching settings may be the ultimate solution but have been relatively limited in the 5 years since the implementation of the common standards.

Future Refinements to the Standards

In the more than 7 years since the implementation of the common duty hour standards, programs and institutions have made changes in education, patient care, and the mechanisms for duty hour monitoring and oversight. However, much of the large-scale change and innovation to adapt to the duty hour limits did not materialize. A small number of programs reengineered their patient care and education systems,³⁴ but most used schedule changes, substitution of residents' clinical work with mid-level practitioners or hospitalists, and an increase in faculty clinical load. Resident education and patient safety are influenced by multiple factors. No single intervention, including limits on resident hours, can ensure safe patient care. There are dangers in implementing added changes without evidence that they will contribute to safer care and better education and offer value for what is likely to be their sizable added cost in a health care system with many demands for constrained resources.

In most programs, residents spend some amount of time performing activities that have little relation to their education. The first encompasses extraneous work that does not require a physician and is addressed in the accreditation standards. The ACGME

Institutional Requirements stipulate that sponsoring institutions provide phlebotomy, radiology, laboratory results reporting, and patient transport to ensure that residents spend minimal time in these activities.³⁵ Institutions that fail to provide these services are cited.

Beyond this, focusing reductions in hours on “noneducational work” is quite difficult, and some added hours are due to inherent inefficiencies in teaching hospitals’ clinical settings. Work in a second category of “noneducational work” includes potentially redundant activities, and wait and travel times, which could be eliminated through reengineering of the teaching environment,³⁶ but interventions would be both costly and complex to initiate. The third type of work with low educational value has proved even more difficult to address. It entails repeated performance of activities that require a licensed practitioner but that residents have learned sufficiently well, such that performance is no longer valuable from a purely educational perspective. The issues related to minimizing this category of work are 2-fold. The first is that reducing this work for residents involves transfer of these activities to faculty or a “mid-level practitioner”; the second is that residents should perform some volume of these activities to maintain skills, with frequency dictated by the learning and practice style of the given resident.

The development of the standards and their implementation proceeded with extensive input from the RRCs and the GME community. The community provided feedback on its experience with the common duty hour standards, including concerns about the negative effects of the limits on learning, patient care, and residents’ professional development. The ACGME had resolved that no revisions to the standards would occur for 5 years, to allow programs to adapt education and patient care systems, and that it would solicit feedback on elements that appeared to reduce educational quality or had other unintended effects, with the goal of identifying areas for refinement. Future changes would be evidence based and would incorporate input from the medical education community and the public.

References

- 1 Philibert I, Friedmann P, Williams WT. New requirements for resident duty hours. *JAMA*. 2002;288:1112–1114.
- 2 Staiger DO, Auerbach DI, Buerhaus PI. Trends in the work hours of physicians in the United States. *JAMA*. 2010;303(8):747–753.
- 3 United States Congress, 105th Sess. The Balanced Budget Act of 1997, HR 2015.ENR. (1997).
- 4 Gurjala A, Lurie P, Haroona L, et al. Petition to the Honorable R. David Layne, Acting Assistant Secretary for Occupational Safety and Health, requesting that limits be placed on hours worked by medical residents. *Public Citizen*. April 30, 2001.
- 5 Conyers J. The Patient and Physician Safety and Protection Act of 2005, HR 1228 (2005).
- 6 Corzine J. Patient and Physician Safety and Protection Act of 2005. S 1297 (2005).
- 7 Samkoff JS, Jacques CHM. A review of studies concerning effects of sleep-deprivation and fatigue on residents’ performance. *Acad Med*. 1991;66:687–693.
- 8 Weinger MB, Ancoli-Israel S. Sleep deprivation and clinical performance. *JAMA*. 2002;287(8):955–957.
- 9 Philibert I. Sleep loss and performance in residents and nonphysicians: a meta-analytic examination. 2005. *Sleep*. 28(11):1392–1402.
- 10 Accreditation Council for Graduate Medical Education. *Report of the ACGME Work Group on Resident Duty Hours*. June 11, 2002.
- 11 Accreditation Council for Graduate Medical Education. *Impact Statement*. Chicago, IL: Accreditation Council for Graduate Medical Education; September 2002.
- 12 Thorpe KE. House staff supervision and working hours: implications of regulatory change in New York State. *JAMA*. 1990;263(23):3177–3181.
- 13 Howard DL, Silber JH, Jobes DR. Do regulations limiting residents’ work hours affect patient mortality? *J Gen Intern Med*. 2004;19(1):1–7.
- 14 Laine C, Goldman L, Soukup JR, Hayes JG. The impact of a regulation restricting medical house staff working hours on the quality of patient care. *JAMA*. 1993;269(3):374–378.
- 15 Holzman IR, Barnett SH. The Bell Commission: ethical implications for the training of physicians. *Mt Sinai J Med*. 2000;67(2):136–139.
- 16 Small GE. House officer stress syndrome. *Psychosomatics*. 1981;22(10):860–869.
- 17 Shanafelt TD, Bradley KA, Wipf JE, Back AL. Burnout and self-reported patient care in an internal medicine residency program. *Ann Intern Med*. 2002;136(5):358–367.
- 18 Yedidia NJ, Lipkin M Jr, Schwartz MD, Hirschhorn C. Doctors as workers—work-hour regulations and interns: perceptions of responsibility, quality of care, and training. *J Gen Int Med*. 1993;8:429–435.
- 19 Epstein RM, Hundert EM. Defining and assessing professional competence. *JAMA*. 2002;287(2):226–235.
- 20 Ludmerer KM. Instilling professionalism in medical education. *JAMA*. 1999;282(9):881–882.
- 21 Blatman KH. The Institute of Medicine resident work hours recommendations: a resident’s viewpoint. *J Clin Sleep Med*. 2009;5(1):13.
- 22 Szymczak JE, Brooks JV, Volpp KG, Bosk CL. To leave or to lie: are concerns about a shift-work mentality and

- eroding professionalism as a result of duty-hour rules justified? *Milbank Q.* 2010;88(3):350–381.
- 23** Jagannathan J, Vates GE, Pouratian N, Sheehan JP, Patrie J, Grady MS, Jane JA. Impact of the Accreditation Council for Graduate Medical Education work-hour regulations on neurosurgical resident education and productivity. *J Neurosurg.* 2009;110(5):820–827.
- 24** Yedidia MJ, Schwartz MD, Hirschhorn C, Lipkin M. Learners as teachers—the conflicting roles of medical residents. *J Gen Intern Med.* 1995;10:615–623.
- 25** Conigliaro J, Frishman WH, Lazar EJ, Croen L. Internal medicine housestaff and attending physician perceptions of the impact of the New York State Section 405 regulations on working conditions and supervision of residents in two training programs. *J Gen Intern Med.* 1993;8(9):502–507.
- 26** Volpp KG, Rosen AK, Rosenbaum PR, Romano PS, et al. Mortality among hospitalized Medicare beneficiaries in the first 2 years following ACGME resident duty hour reform. *JAMA.* 2007;298(9):975–983.
- 27** Volpp KG, Rosen AK, Rosenbaum PR, Romano PS, et al. Mortality among patients in VA hospitals in the first 2 years following ACGME resident duty hour reform. *JAMA.* 2007;298(9):984–992.
- 28** Shetty KD, Bhattacharya J. Changes in hospital mortality associated with residency work-hour regulations. *Ann Intern Med.* 2007;147(2):73–80.
- 29** Prasad M, Iwashyna TJ, Christie JD, et al. Effect of work-hours regulations on intensive care unit mortality in United States teaching hospitals. *Crit Care Med.* 2009;37(9):2564–2569.
- 30** Silber JH, Rosenbaum PR, Rosen AK, et al. Prolonged hospital stay and the resident duty hour rules of 2003. *Med Care.* 2009;47(12):1191–1200.
- 31** Press MJ, Silber JH, Rosen AK, et al. The impact of resident duty hour reform on hospital readmission rates among medicare beneficiaries [published online ahead of print November 6, 2010]. *J Gen Intern Med.*
- 32** Weinstein DF. Duty hours for resident physicians: tough choices for teaching hospitals. *New Engl J Med.* 2002;347(16):1275–1278.
- 33** Knickman J, Lipkin M, Finkler S, Thompson W, Kiel J. The potential for using non-physicians to compensate for the reduced availability of residents. *Acad Med.* 1992;67:429–438.
- 34** Darosa DA, Bell RH Jr, Dunnington GL. Residency program models, implications, and evaluation: results of a think tank consortium on resident work hours. *Surgery.* 2003;133(1):13–23.
- 35** Accreditation Council for Graduate Medical Education. ACGME Institutional Requirements. Available at: http://www.acgme.org/acWebsite/irc/irc_IRCpr07012007.pdf. Effective July 1, 2007. Accessed November 25, 2010.
- 36** Gabow PA, Karkhanis A, Knight A, Dixon P, Eisert S, Albert RK. Observations of residents' work activities for 24 consecutive hours: implications for workflow redesign. *Acad Med.* 2006;81(8):766–775.