HOD ACTION: Council on Medical Education Report 2 adopted as amended and the remainder of the report filed.

COUNCIL ON MEDICAL EDUCATION REPORT 2-I-09
Resident/Fellow Duty Hours, Quality of Physician Training, and Patient Safety
(Resolution 327, A-09, and Resolution 330, A-09)
(Reference Committee K)

EXECUTIVE SUMMARY

In December 2008, the Institute of Medicine (IOM) released *Resident Duty Hours: Enhancing Sleep, Supervision, and Safety*, a report that calls for, in part:

- Reducing the maximum number of hours that residents can work without time for sleep to 16
- Allowing overnight call only with a required 5-hour sleep/nap period
- Increasing the number of days residents must have off
- Restricting moonlighting during residents' off-hours

In addition, the report calls for continued research and more data on duty hours and patient safety. The report notes that the biggest barriers to implementing these changes are cost (an estimated $1.7 billion per year) and an insufficient health care workforce to substitute for the time of residents.

Reaction from physicians and the public has been mixed, with strong opinions both for and against additional restrictions. The AMA's initial response was mixed as well, and further consideration of the IOM report's potential ramifications led to objections to particular recommendations.

The Accreditation Council for Graduate Medical Education (ACGME) is charged with the task of responding to the IOM's recommendations by December 2010. In February 2009, the ACGME solicited feedback from medical organizations on the IOM's recommendations as well as the ACGME's current duty hours standards. In March, the ACGME held a symposium that focused on a five-year review of its duty hour standards, implemented in July 2003. In June, the ACGME invited medical organizations to attend a duty hours congress to provide formal feedback on the ACGME standards and the IOM recommendations. Currently, the ACGME is conducting three comprehensive reviews of the literature on duty hours and related topics and is planning a consultation with leading ethicists of the issues of professionalism surrounding duty hours.

In measuring the quality of the graduate medical education learning environment and the quality of patient care delivered by resident physicians, duty hours is only one metric. Beyond duty hours are other fundamental and vexing issues affecting both the learning environment and patient safety/quality of care, including physician preparedness for practice, supervision, workload, handoffs, scheduling, enforced sleep periods, flexibility for different specialties, professionalism, personal responsibility, moonlighting, at-home call, and the cost ramifications of any fundamental change.

Among its recommendations, this report calls for reaffirmation of current ACGME duty hour standards, with any proposed changes to be based on the results of additional research. It also recommends that the ACGME allow for appropriate flexibility in duty hour standards for different disciplines and different training levels, and urges the ACGME to include external moonlighting hours in the calculation of duty hours. Further, the report urges that the AMA reject the IOM report's call for a protected sleep period and to advocate against any outside involvement in GME accreditation. It also calls for communication to the GME community on the importance of accurate reporting of resident duty hours. Finally, it encourages educating the public about the

many contributions of residents/fellows to high-quality patient care and the importance of trainees' realizing their limits (under proper supervision) so they can learn to competently and independently practice under real-world medical situations.

REPORT OF THE COUNCIL ON MEDICAL EDUCATION

CME Report 2-I-09

Subject: Resident/Fellow Duty Hours, Quality of Physician Training, and Patient Safety (Resolution 327, A-09, and Resolution 330, A-09)

Presented by: Susan Rudd Bailey, MD, Chair

Referred to: Reference Committee K
(Peter C. Amadio, MD, Chair)

This report is a follow-up to Council on Medical Education (CME) Report 5 (A-08), "Enforcement of Duty Hours Standards and Improving Resident, Fellow and Patient Safety," which asked, in part, that our American Medical Association "continue to monitor the enforcement and impact of the Accreditation Council for Graduate Medical Education duty hour standards, as they relate to the larger issue of the optimal learning environment for residents, and monitor relevant research on duty hours, sleep, and resident and patient safety." In addition, the report asked that our AMA, "as part of its Initiative to Transform Medical Education strategic focus, utilize relevant evidence on patient safety and sleep to develop a learning environment model that optimizes balance between resident education, patient care, quality and safety." The report also called for future reporting on the progress of these two recommendations.

This report also addresses the following items:

- Resolves 3 through 6 of Resolution 327 (A-09), "Resident Duty Hours: A Review of the Institute of Medicine Recommendations," which asked that our AMA "oppose the involvement of outside organizations, including CMS and The Joint Commission, in the monitoring of duty hours (Resolve 3); support the development of specialty-specific guidelines for duty hours (Resolve 4); support the development of procedures to be used in transferring patient care (Resolve 5); and urge the ACGME to include external moonlighting hours in the calculation of duty hours (Resolve 6)." Because of the considerable complexity of these issues, and their high visibility among medical students, trainees, physicians, and the public (from both an educational and patient safety perspective), the AMA House of Delegates (HOD) called for further consideration and referred Resolves 3 through 6 of the resolution. Resolves 1 and 2 were adopted.

- Resolution 330 (A-09), "Opposition to Protected Sleep Time," introduced by the Medical Student Section, which asked our AMA to support the evaluation and improvement of duty hours reform that does not include protected sleep time and to also support additional study of the issues raised in the 2008 Institute of Medicine report on duty hours, and to consider further modifications of the current duty hours requirements based on the results of this inquiry. In light of testimony before Reference Committee C that a protected sleep period may have significant ramifications for continuity of patient care and safety, as well as being difficult to implement and monitor, this resolution was referred by the AMA HOD for further study.

- CME Report 8 (A-07), "Intern and Resident Burnout," which asked that our AMA "continue to monitor this issue and track its progress, including publication of peer-reviewed research and changes in accreditation requirements, with a report back at the 2009 Interim Meeting of the AMA House of Delegates."

- CME Report 5 (I-08), "Use of At-Home Call by Residency Programs," which asked that the Council "incorporate a review of at-home call issues in the duty hours follow-up report due at the 2010 annual meeting."

THE ACGME DUTY HOURS STANDARDS AND THEIR MONITORING AND ENFORCEMENT

The ACGME duty hour standards went into effect in July 2003 and require:

- An 80-hour weekly limit, averaged over 4 weeks, inclusive of all in-house call activities.*
- A 10-hour rest period between duty periods and after in-house call.
- A 24-hour limit on continuous duty, with up to 6 additional hours for continuity of care and education.
- No new patients to be accepted after 24 hours of continuous duty.
- One day in 7 free from patient care and educational obligations, averaged over 4 weeks, inclusive of call.
- In-house call no more than once every 3 nights, averaged over 4 weeks.

* Note: Programs in some specialties (neurological surgery, for example) may apply to the ACGME for an 8-hour increase in weekly duty hours.

At the September 2008 ACGME meeting, chief executive officer Thomas J. Nasca, MD, MACP, provided an update on duty hour violations and the recommendations of the ACGME Monitoring Committee to address the problem. He noted that duty hour violations are unacceptable, regardless of specialty or sponsoring institution, because they are a risk to the safety of residents and potentially to patients, a risk to the accreditation authority of the ACGME, and a threat to professional self-regulation. In addition, Dr. Nasca reported "a significant correlation between resident-reported violations of duty hours with deficits in other important areas of the learning environment." Dr. Nasca reported that 101 programs out of 2,865 had been identified as potential outliers in the ACGME's 2007-2008 resident survey; 30 of these programs had also been identified during the previous survey cycle as having significant duty hour issues. Twenty-one programs were sent warning letters and nine had shortened site visits scheduled in 2007.

As noted in the CME Report 5 (A-08), the issue of confidentiality for and protection of residents/fellows who report program violations of duty hour regulations continues to be a concern. Some residents may face intimidation and pressure by attending physicians and senior residents/fellows to under-report actual duty hours; this, combined with residents' fears of negative consequences for programs, program directors, and their own careers in the event of program probation or withdrawal, are powerful disincentives to honest and accurate reporting. Furthermore, many residents are reluctant to leave tasks undone or to shift care for sick and unstable patients to their colleagues. In addition, true anonymity is hard if not impossible to ensure for residents in smaller programs.

THE INSTITUTE OF MEDICINE REPORT ON DUTY HOURS

In September 2007, the Institute of Medicine (IOM) appointed the Committee on Optimizing Graduate Medical Trainee (Resident) Hours and Work Schedules to Improve Patient Safety, at the request of Congress and the Agency for Healthcare Research and Quality. The Committee's two primary objectives were to:

- Synthesize current evidence on medical resident schedules and healthcare safety; and
- Develop strategies for implementing optimal work schedules to improve safety in health care.

The Committee held five meetings and two conference calls between December 2007 and August 2008, with presentations from invited experts and opportunity for questions/comments from the public at three of the five meetings. The Committee heard from presenters representing the perspectives of the accreditation and certification community, organized medicine, medical students, residents, patient safety advocates, and researchers on sleep and patient outcomes, as well as program directors in primary and surgical specialties; specific organizations included the following:

- Accreditation Council for Graduate Medical Education
- AMA Medical Student Section
- AMA Resident and Fellow Section
- American Board of Medical Specialties
- American Hospital Association
- American Medical Students Association
- Association of American Medical Colleges
- Centers for Medicare and Medicaid Services
- Committee of Interns and Residents
- The Joint Commission
- Public Citizen

The Committee's report, *Resident Duty Hours: Enhancing Sleep, Supervision, and Safety* (available at: *www.iom.edu/residenthours*) was released on December 2, 2008. It does not recommend further reducing residents' work hours from the ACGME's current 80-hour limit but calls for:

- Reducing the maximum number of hours that residents can work without time for sleep to 16.
- Allowing overnight call only with a required 5-hour sleep/nap period.
- Increasing the number of days residents must have off.
- Restricting moonlighting during residents' off-hours.

The Committee's recommendations also call for greater supervision of residents, limits on patient caseloads based on residents' experience and specialty, increased interdisciplinary teamwork, and overlap in schedules during shift changes to reduce the chances for error during handoffs. In addition, the Committee calls for continued research and more data on duty hours and patient safety. The report notes that the biggest barriers to implementing these changes are cost (an estimated $1.7 billion per year) and an insufficient health care workforce to substitute for the time of residents. Nonetheless, the report indicates that "action on all recommendations should be taken within 24 months," that is, by December 2010.

ACGME, IOM, AND AMA POSITIONS ON DUTY HOURS

A chart comparing the current (2003) ACGME standards to the IOM recommendations (and existing AMA policy) may aid in more fully understanding some of the major points of concord and discord.

Duty Hours Limits	**2003 ACGME Standards**	**IOM Recommendations**	**AMA Policy**
Maximum hours of work per week	80 hours averaged over 4 weeks	No change	Supports current ACGME policy
Maximum shift length	30 hours, with 24 hours for admitting new patients and then 6 hours to complete work, transfer care and education	30 hours with 16 hours for admitting new patients, then 5 hour protected sleep, then remaining time for completing work and education. Alternative: 16 hours with no protected sleep	Supports original ACGME policy but recommends additional study
Maximum in-hospital on call frequency	Every 3rd night, on average	Every 3rd night, no averaging	Supports current ACGME policy
Minimum time off between scheduled shifts	10 hours	10 hours after shift 12 hours after night 14 hours after 30 hours	Supports current ACGME policy
Maximum frequency of in-hospital night shifts	Not addressed	4 consecutive night maximum 48 hours off after 3 or 4 night on	Supports current ACGME policy (which does not address this aspect)
Moonlighting	Internal moonlighting counted in 80 hours	All moonlighting counted in 80 hours All other restrictions apply to moonlighting in combination with scheduled work	Supports current ACGME policy
Limit on hours for exceptions	88 hours for select programs with educational rationale	No change	Supports current ACGME policy
Emergency Room Limits	12 hours shifts with 12 hours off between shifts; 60 hour work week with additional 12 hours for education	No change	Supports current ACGME policy

REACTION TO THE IOM REPORT

It has been said that the true test of any good law on a controversial subject is whether it makes no one entirely happy—in that, the IOM report seems to have succeeded. Some are pleased with the limit in shift length to 16 hours but have questioned the feasibility and practicality of the five-hour protected sleep period. Some are pleased that the 80-hour limit was maintained; others, such as Public Citizen, wanted to see a reduction to move the US closer to European standards. Residents (or "junior doctors") in Europe are limited to 48 duty hours per week under the European Working Time Directive.

Within the graduate medical education (GME) community, varying viewpoints were quickly expressed. Although most residents favor duty hour limits and most program directors decry the rigidity of their implementation, some trainees and many attending physicians (especially in surgical specialties) believe residents' education is being shortchanged by the 80-hour weekly limit. Although evidence is anecdotal, it appears that a number of attending physicians and program directors feel that the current generation of trainees is being inadequately prepared for the rigors of practice post-training. Also, work not completed by residents/fellows during shifts often falls to attendings, who are not subject to duty hour limits, although a recent article in *Pediatrics* calls for just such regulation to end "unnecessary and unjustified risk to patients."[1]

Anecdotal comments, such as the following received via the AMA's monthly *GME e-Letter*, are an additional indication of the skepticism that greeted the IOM report: "Several of us see problems with inpatient continuity and follow-up, growing resident knowledge-base deficits, declining sense of ownership of patient outcomes, and (anecdotally) an increase rather than decrease in medical errors."

The general public and public advocates (Public Citizen, for example) continue to compare residents' schedules to workers in other industries with regulated work hours, such as truck drivers and airline pilots, and call for reduced hours to increase patient safety and reduce medical error. Program directors and educators counter that shorter shifts mean more handoffs and transfers of care, which are associated with their own risk for adverse events, and that educational goals (and service needs) are already being compromised under the current standards.

AMA RESPONSE TO THE IOM REPORT

The AMA's initial response to the IOM report was mixed. The AMA welcomed the IOM's support for the 80-hour weekly limit, which has been reflected in AMA policy since 2002. Further consideration of the report and its potential ramifications, however, particularly by medical student, resident/fellow physician, and academic physician members of the association, led to objections to particular elements of the IOM recommendations (as reflected, for example, in Resolutions 327 and 330 noted above).

At the AMA's annual meeting in June 2009, the issue of resident/fellow duty hours was a key topic, with two separate educational sessions on the issue. One session focused specifically on the IOM report, with presentations from two members of the IOM committee:

- Jordan J. Cohen, MD, Professor, Medicine and Public Health, George Washington University, Washington, DC
- David F. Dinges, PhD, Professor and Chief, Division of Sleep and Chronobiology, Department of Psychiatry, University of Pennsylvania School of Medicine, Philadelphia

Among the items covered was one of the IOM's more controversial recommendations—a five-hour nap period during extended shifts (longer than 16 hours). As noted in Resolution 330, described above, overly prescriptive solutions to a complex problem may have unintended negative consequences for both resident education and quality of care and may cause more problems than they solve. Naps would be difficult to implement and monitor, and would in effect result in a 12 percent reduction in the work week, according to a representative of the Association of Program Directors in Surgery who testified at the ACGME duty hours congress in June 2009.
In addition, a joint educational program of the Council on Medical Education and the Section on Medical Schools featured a vigorous, interactive discussion of the intended and unintended consequences of the current regulations and addressed the following questions:

- What is the impact of duty hour limits on the workload and learning of residents and on medical students?
- How have duty hour limits changed the workload and teaching of attendings?
- In terms of patient-care safety and quality, and resident learning, what is the relative importance of duty hour limits compared with: 1) appropriate supervision, 2) hand-overs, 3) patient continuity, 4) attending rounds, 5) teaching conferences, 6) sleep/rest or 7) other factors?
- Are residency training lengths still adequate—especially in procedural specialties? If not, are some specialties considering extending the length of training programs?
- How is the transition into practice (where there are no duty hour limits) changing?
- Are residents getting more sleep? If so, are they learning and/or performing better with more sleep?
- Has the professionalism of residents changed and if so, in what way?
- Looking forward, what additional data do we need to improve the learning environment of residents while striving to improve patient safety and quality?

These and other major issues that were identified are discussed fully in "Discussion and Future Direction," below.

ACGME RESPONSE TO THE IOM REPORT

As the recognized accrediting body for allopathic graduate medical education programs in the US, the ACGME (and its constituent organizations, including the AMA) is charged with the task of responding to the IOM's recommendations by December 2010. At its February 2009 meeting, the ACGME Board of Directors endorsed a systematic review of duty hours and the learning environment, with a goal of creating more appropriate, flexible standards that recognize the challenges presented in the training of each specialty. In an "Open Letter to the GME Community" sent later that month, Dr. Nasca noted:

> In our well meaning attempt to limit resident duty hours to improve their education and diminish the effects of acute and chronic sleep deprivation, we have placed many of our residents all too often in [an] ethical quandary. We force them to choose between caring for their patients the way they know they should, or satisfying a well meaning standard. In other words, we compel them to lie if they do the right thing for their patients. I posit to you that this is unacceptable. We must find a way to both assure proper and timely transitions in care (for both resident and patients' sake), while respecting and nurturing the effacement of self interest that is at the core of the trust between our patients and their physicians. And, in those programs where the culture needs to be changed, or institutions where residents are abused rather than nurtured in the profession, change must, and will, happen.[2]

Also in February, the ACGME began to solicit feedback from organizations responsible for or participating in the education of physicians, and organizations representing various aspects of the physician community (including the AMA). The request included a call for formal positions on the IOM's recommendations as well as the ACGME's current duty hours standards, including an analysis of costs and impact of implementation. In addition, organizations were invited to attend an ACGME duty hours congress in June 2009 (described in more detail below).

In March, prior to its annual educational conference, the ACGME held a duty hours symposium, "Promoting Good Learning and Safe, Effective Care: A Five-Year Review of the ACGME's Common Duty Hour Standards." The symposium was convened to help the ACGME obtain input from multiple perspectives and stakeholders and reconcile these viewpoints to design of standards that promote an optimal learning environment as well as patient safety and quality. Presenters covered such topics as fatigue and its effects on performance; continuity of care and patient safety; the duty hours research agenda; and US duty hour standards versus those of Canada and the United Kingdom. Some key points from the symposium:

- Mitigating fatigue is the real issue—not duty hours per se. Towards this end, uniform regulation is not an appropriate response.
- Since 2003, work/life balance has improved for residents/fellows, but more patient care handoffs are occurring (to the detriment of patient safety) and the shiftwork mentality has become more prevalent.
- Without adequate funding, implementation of the IOM's recommendations would be difficult.
- An additional "transition to practice" year of residency may be helpful for some trainees.

In June, the ACGME convened the duty hours congress to help determine the best strategy for responding to the IOM's recommendations. Testimony was heard from 44 of the more than 120 professional associations, program director organizations, and other groups that submitted formal position papers to the ACGME on this topic. Organizations that provided testimony were divided into groups:

- Group 1—Internal Medicine
- Group 2—Surgery and Surgical Specialties
- Group 3—Pediatrics and Pediatric Subspecialties, and Women's Health
- Group 4—Hospital Based Specialties (emergency medicine, radiology, anesthesiology, pathology)
- Group 5—Psychiatry, Neurology, Allergy and Immunology, and Family Medicine
- Group 6—Medical Students, Residents, and Resident Unions (AMSA, CIR, ORR, Resident and Associate Society of the American College of Surgeons)
- Group 7—National Organizations with Major Involvement in American Graduate Medical Education (AHME, AIAMC, VA, AAMC, ABMS, AHA, AMA, CMSS)

One emphatic message was shared by all speakers: "One size does not fit all"; that is, flexibility in duty hour standards is a must. This invited the question, however, "How many different sizes do we need?" Further, "What are the criteria for determining an appropriate grouping?" In addition, too much flexibility may be as problematic as too little. Both the AHA and AMA speakers, in particular, cautioned against letting the pendulum swing too far towards flexibility, which could lead to a negative response in the press and the "court of public opinion" as well as renewed calls for federal legislation of duty hours. Another challenge would be for institutional officials to operationalize the requirements and monitor adherence for a wide variety of programs.

Nonetheless, consensus was expressed for different solutions for different fields and individuals with varying levels of experience, from interns through to chief residents.

Other issues of note:

- The GME community needs to move beyond duty hours to more essential (if less easily measured) concerns, such as resident supervision, patient safety, and quality improvement.
- More research and data are needed on the effects of duty hours, both during and post-GME. Cohorts of trainees in nearly all fields have trained solely under the 80-hour weekly limit, which should provide fertile ground for research on the adjustment period between training under weekly limits and entering practice as a new physician without such limits.
- Ethical and professionalism concerns are ongoing, in two different aspects: For residents who exceed duty hour limits and then submit false reports on hours worked (under unspoken pressure by program directors and/or colleagues), and for residents (or "Generation Me," as one speaker put it) who are all too happy to clock out when their shift ends place individual needs above those of the patient.
- Testimony was nearly unanimous that professional self-regulation in GME accreditation should not be infringed upon by outside involvement from the federal government or the Joint Commission.
- In the "court of public opinion," medicine continues to be misunderstood, as does GME and the justified educational need for what seem to the public to be excessive work hours.
- Concerns with resident/fellow fatigue must be balanced with the potential miscommunications that occur during handoffs, which can have patient safety implications.
- The question of costs to replace/augment the resident/fellow workforce if the IOM recommendations are fully implemented.
- Increasing the length of training is not a good option, and might lead to increased moonlighting, to supplement the trainee's salary and pay off medical school debt. In addition, longer training would make certain fields (e.g., thoracic surgery) less attractive to students.
- Further compression of the work week may decrease the amount of time for self-reflection and a deeper understanding of/communication with patients. In addition, the mentor-trainee relationship would suffer.
- Unless additional health workforce are allocated accordingly, the "Nap Gap" (the IOM's recommendation for a 5-hour protected nap period after 16 hours on duty) would result in decreased coverage in the emergency department by inpatient services that need to see patients in the ED prior to admission; this, in turn, would lead to increased delays in admissions, increased ED crowding, and decreased patient safety.
- Reaction to sleep deprivation varies from one individual to the next (and can change over one's life); it can also be dependent on the activity (reading vs. surgery, for example). A recent study, for example, found a genetic mutation in people who need far less sleep than average.[3]

At its June board meeting, the ACGME discussed the just-concluded congress as well as the status of its Committee on Innovation, which reported that several of its pilot projects related to the learning environment were on hold due to the congress. It was noted that one of the key themes of the congress was a call for more research on duty hours (and funding for such research). In this regard, ACGME staff have met with the Agency for Healthcare Research and Quality (AHRQ) to discuss funding, by foundations and governmental bodies, of a multi-institutional survey on duty

hours. Although it would be inappropriate for the ACGME to use accreditation fees to fund research, the ACGME agreed to help coordinate such research.

Currently the ACGME is conducting three comprehensive reviews of the literature on duty hours and related topics, which will help inform its response to the IOM. In addition, it is planning a consultation with leading ethicists of the issues of professionalism surrounding duty hours. Finally, "the ACGME will initiate a separate, annual 'Patient Safety and the Learning Environment' evaluation of each ACGME-accredited sponsor coincident with the implementation of new duty hour standards."[4]

RECENT LITERATURE ON AND MEDIA COVERAGE OF DUTY HOURS

Note: This section covers the period of March 2008 (when the last CME report on duty hours was drafted) through August 2009.

Because the IOM report was issued in December 2008, not enough time has elapsed for consideration of its recommendations in peer-reviewed publications. The one significant exception is a study in the May 21, 2009 *New England Journal of Medicine* that estimated a cost of $1.6 billion per year to implement the IOM's recommendations.[5] "Implementing the four IOM recommendations would be costly, and their effectiveness is unknown," the study concluded. "If highly effective, they could prevent patient harm at reduced or no cost from the societal perspective. However, net costs to teaching hospitals would remain high." In light of this assessment, particularly in today's tenuous funding paradigm, the authors of a related *NEJM* editorial stated:

> The IOM committee urged rapid implementation of their recommendations. We strongly disagree. In this era of evidence-based medicine and comparative effectiveness, such a major policy change should be based not only on the recommendations of an expert committee but also on careful studies and evidence that improvements in both patient and educational outcomes will result. To date, the necessary research has not been done and the evidence of benefit is lacking.[6]

Other recent literature of note includes:

- A study of 220 pediatrics residents at three hospitals found no changes in total work and sleep hours 1 year after the ACGME duty hour regulations were implemented. Rates of accidental needle-sticks and auto accidents remained the same, although rates of burnout fell from 75 percent to 57 percent.[7]

- Among neurological surgeons, board certification test scores and levels of participation in national conferences declined after implementation of duty hour limits in 2003. The study also found that 96 percent of chief residents and residency programs directors believed that the 80-hour limit had compromised resident training, and 98 percent believed that it had led to a decrease in surgical experience.[8]

- A study of 56 internal medicine interns found that cutting shift lengths only compresses more work into less time and results in negative consequences; "increased on-call workload was associated with more sleep loss, longer shift duration, and a lower likelihood of participation in educational activities."[9]

- Complication rates for gallbladder surgery at a major public teaching hospital went down significantly after duty hour limits were implemented; the authors speculate that the increased participation of attendings in procedures may in part account for the improvement.[10]

- A survey of 314 attending physicians at a major academic medical center found that satisfaction with teaching declined after duty hour limits were implemented in 2003.[11]

Through both peer-reviewed and media outlets, numerous physicians have reflected on the impact of duty hours, often comparing their own training experience prior to duty hour limits to the current educational paradigm. A noted commentator in this regard is Pauline Chen, MD, who writes in *The New York Times*. In her December 4, 2008 column, she writes that the exhaustion caused by 100-plus hour shifts was not beneficial, but the ability to devote oneself to the patient, without having to look at the clock constantly, meant that graduates could move into real-world practice with confidence.[12] Also writing in the *Times*, Barron Lerner, MD, reflects on the changes in GME after the death of Libby Zion 25 years ago (which many attribute more to lack of supervision than resident fatigue), contrasting the "insanity" of 36-hour shifts to today's "well-rested, pleasant and enthusiastic residents."[13] At the same time, Sandeep Jauhar, MD, cautions that "The Nightmare of Night Float" and botched hand-offs "may well weaken medicine more than exhausted residents ever did."[14] Stephen Bergman, MD, who authored the novel *The House of God* 30 years ago, contends that, even in surgery, "superhuman" stamina can't supersede human limits: "In terms of the best care of the patient, the real valor is to turn it over to the fresh surgeon just coming in after a good night's rest."[15]

Other physicians are more contentious in their views: One otolaryngology resident lashes back at "doctors who criticize the IOM's report as nothing more than the coddling of a bunch of soft, whining residents."[16] Another essay describes "cockamamie resident physician work schedules that look more like Bingo cards than a comprehensive system for providing coordinated medical care or educating future medical specialists."[17] A third commentator offers a Swiftian modest proposal: Zero duty hours, zero patient errors:

> I predict that if studies based on 60- and 70-hour work weeks fail to eliminate clinical errors or markedly decrease patient mortality rates (a likely result), the next recommended studies will involve decreasing the work week to 50 and then 40 hours. Someday, we may reach the apex of care, reducing clinical errors and patient mortality rates to zero by restricting trainees from providing any medical care and instead giving them complete freedom to learn from books and the Internet, at home, on their own timetables.[18]

These are just a sampling of the views on duty hours in circulation. Readers of the *New England Journal of Medicine*, for example, submitted 223 comments on an article detailing the IOM report.[19] In short, physicians have strong opinions on this topic, and the intense debate on the IOM's recommendations (and the ACGME's response) will continue.

Editorial reports in the general media are equally vocal and, in regard to the IOM report, almost universally in favor of its recommendations or even stronger measures. For example, a *New York Times* editorial published after the report calls for an outright ban on shifts longer than 16 hours (rather than supporting the IOM's controversial call for a five-hour nap after 16 hours) and asserts the need for direct federal (and Joint Commission) oversight if violations continue to occur.[20] Similarly, a *USA Today* editorial applauds the report and directs blame towards the ACGME for weak monitoring of its regulations and ineffective whistle-blower protection.[21] (In the same issue, Dr. Nasca of the ACGME argues that duty hours is "one element within a complex matrix of

educational and health care factors" and notes that quality of care is higher in teaching hospitals than in non-teaching hospitals.[22]) A third editorial, in the *Los Angeles Times*, questions the authority of physicians to counsel patients about the importance of sleep when sleep deprivation is an unavoidable component of medical education and practice.[23]

Among both the media and the general public, the lack of a nuanced understanding of the many issues surrounding duty hours points to the need for the medical education community, and medicine as a whole, to better communicate that quality patient care is impossible without quality education and training. Further, the public must understand that medical education, and the inculcation of professional values, must perforce involve trainees' stretching their limits (under proper supervision), similar to the training, say, of world-class athletes, so that real-life (or, to continue the metaphor, "game") situations can be met. Patients have legitimate concerns about both physician fatigue and discontinuity of care; ensuring true patient-centered care demands that patient perspectives be taken into account when redesigning resident schedules.[24]

DISCUSSION AND FUTURE DIRECTION

In measuring the quality of the graduate medical education learning environment and its delivery of patient care, duty hours is only one metric (albeit the most easily measured, and perhaps the most hotly debated). In some sense, this issue has become the "whipping boy" for a variety of systemic ills and inefficiencies in health care, not just GME, and any solution that only "tinker[s] around the edges with artificial and impractical time restrictions" is necessarily incomplete.[25] Looking beyond the number of hours worked, other more fundamental and perhaps more vexing issues emerge:

- *Patient quality/safety*—The link between duty hours and quality of patient care is weak or tenuous, with the few published studies showing weak correlation or conflicting results. From the patient's perspective, having one physician dedicated to one's care is optimal; patients, however, also want well-rested physicians, so a balance between continuity and appropriate rest must be maintained. It is also important to realize that susceptibility to fatigue varies from one individual to the next; rather than a universal measure of number of hours worked, a more fluid "fitness for duty" tool could be employed, to allow for a tailored approach that serves both service and educational needs. Such practices should be part of a larger institutional culture of quality and safety.

- *Preparedness for practice*—Are physicians training under current duty hour limits as well-prepared for the real-world rigors of practice as their predecessors? One measure of practice readiness is board certification test scores; a recent study of neurological surgeons, referenced above, showed a decline in scores after implementation of duty hour limits in 2003. As residents proceed through their training, they may begin to have misgivings that their training has fully prepared them for independent practice: A recent survey of resident and associate members of the American College of Surgeons found that 41 percent believed that duty hour limits are an "important barrier to their education" and that those closer to graduation felt more strongly that duty hour limits interfered with their education as compared with residents in their first and second years (32 percent versus seven percent).[26]

- *Supervision*—Attending physicians and program directors play a key role in ensuring not only that the letter of the law is obeyed vis-à-vis duty hours but also that training takes place in a supportive environment that values teamwork, interdisciplinary communication, and collaborative learning. Further, supervision must be tailored as much as possible to the trainee, in light of the individual's level of training, skills, and learning style. In addition,

supervision should be proactive, with attendings checking in on a routine basis with residents (particularly first-year residents) rather than waiting to be contacted.

- *Workload*—Closely related to patient safety and appropriate supervision is the compression of the workload for residents/fellows (and throughout health care). The limits for the number of hours worked may be set, but the number of patients is not so easily controlled. With increased use of night-float and at-home call, fewer residents may be responsible for more patients; without adequate supervision, this can be a recipe for disaster. Duties of little or no educational value should be reassigned to other personnel or reengineered (e.g., eliminate the need for carrying charts from one department to the next by developing electronic information systems). The RRCs should set specialty-specific guidelines for the number of patients residents can treat during a shift, taking into consideration the level of training and the characteristics of the patients.

- *Handoffs*—Teamwork, interdisciplinary communication, and appropriate electronic systems are essential to ensuring safe, informative handoffs, which have become even more critical as the lengths of shifts have decreased. Resolution 329 (A-09) calls for the ACGME to require "that GME training institutions ensure that trainees in all specialties are provided with an effective, systematic approach for handoffs of clinical information and transfer of care between trainees within their institution," as well as to "identify best practices including the presence, quality, and utilization of computerized systems, for transfer of care in training programs in all specialties." Interest in handoffs extends beyond the GME community to patient safety advocates, both here and abroad; the World Health Organization has listed "Communication during Patient Care Handovers" as one of its High 5 patient safety initiatives,[27] and the August 2009 issue of *Quality and Safety in Health Care*, based in London, features a wide-ranging collection of papers on this issue. In their commentary on these studies, Drs. Julie K. Johnson and Vineet M. Arora[28] offer four recommendations to lead to better processes: 1) Focus on improving the content and the process of handovers, include physician trainees in the redesign process, and work towards "well-designed, ergonomic solutions and consistent policies"; 2) Be cognizant of and responsive to the local context, or culture, of the care-giving team rather than dropping in a best practice wholesale; 3) Move from implicit, on-the-job training for handovers to a more defined, standardized, competency-based training program with a didactic component; and 4) Incorporate new methods for improving handover quality, such as positive deviance, collaborative learning, and systems redesign.

- *The "nap gap"*—The IOM's recommendation for a five-hour protected sleep period after 16 hours on duty has been criticized as difficult to enforce and a potential scheduling nightmare. Although a 2006 study found evidence that naps can increase sleep and decrease fatigue among residents, adherence to the nap schedule was low (19 percent), due in part to residents' concerns about gaps in patient care.[29] Further, the financial costs are significant: Annual costs for substitute providers if this recommendation were adopted would be $559 million annually, or from $168 million to $480 million if additional residents assumed the excess work.[30]

- *Flexibility for different specialties*—The various specialties/subspecialties have different schedules related to their workflow and different requirements. In surgery, for example, certain procedures require lengthy involvement that could exceed certain shift lengths. Some level of flexibility in duty hour standards is probably needed, but too much variance could be as problematic as too little.

- *Professionalism and personal responsibility*—The unintended consequence of the shift-work mentality must be addressed; the requirements of patient care and devotion to one's education must supersede the resident's personal needs. At the same time, professionalism also extends to the resident's honest, accurate reporting of actual hours worked. Systems in medical education (including duty hour limits) can enable ethical behavior; a reduction in fatigue can help increase physicians' empathy and increase the likelihood that physicians make decisions that strengthen the doctor-patient relationship.[31] Some argue, in fact, that stricter duty hour limits are needed to ensure that medicine remains a "moral enterprise."[32] Others contend that less scheduled time (for example, 75 hours per week with a five-hour cushion, at the resident's discretion) could help restore a sense of the individual control and self-regulation that characterizes a professional.[33]

- *Moonlighting*—At the ACGME duty hours congress, the majority of testimony was in favor of including all moonlighting, both internal and external, in the 80-hour weekly limit, as proposed by the IOM. Nonetheless, concern was expressed that this could be hard to define accurately and to monitor, and that other activities outside of training (e.g., child care responsibilities) are as demanding, if not more, of one's time and energy. Recognizing that increasing levels of medical school debt are contributing to the need for residents/fellows to moonlight, more financial assistance (such as subsidized child care, loan deferment, debt forgiveness, and tax credits) may help treat the root causes and make moonlighting a moot point.

- *At-home call*—The IOM report does not address this issue, although some have expressed concern that at-home call is being used by programs in some specialties to circumvent the intent of duty hour limits. With continuing advances in communications technologies in medicine, the lines between "work" and "home" continue to blur. Just as the practice of telemedicine continues to grow, a "virtual presence" in one's residency/fellowship program may become more common, particularly in certain disciplines that lend themselves to technological interventions. At the same time, because of the intense demands of training, protected time for rest and relaxation is required, free from e-mails, phone calls, and electronic paging. The growing body of research on sleep deprivation and burnout attest to the importance of "down time." CME Report 5 (I-08) called for more research into this issue, which is ongoing, and encouraged the ACGME to collect and disseminate data on at-home call by specialty from both program directors and from residents and fellows. It also asked that the ACGME change its program requirements to account for all duty hours, regardless of setting, in calculating the 80-hour work week, while at the same time allowing for flexible solutions from one specialty to the next. Finally, it asked the AMA to encourage the ACGME and the GME community to examine the effects of the increased use of at-home call on resident education and supervision and develop appropriate standards to ensure that appropriate education and supervision is maintained, regardless of the setting.

- *Costs*—As health care reform advocates urge "bending the growth of the cost curve," what are the financial consequences of further limiting duty hours, and which entity (or entities) would be responsible for bearing these costs? The study referenced above estimated a cost of $1.6 billion per year to implement the IOM's recommendations. If these costs were to fall solely or even largely on teaching hospitals, the effect could be to further endanger these institutions, which play a significant role in many locations as a safety net for the poor and uninsured. This could also jeopardize their ability to continue their educational and research missions.

Many have commented on the need for more research and study into duty hours and its effect on the learning and patient care environment. Future study could examine some of these questions:

- What has been the impact on the workload and learning of students?
- What has been the impact on attendings?
- Are the lengths of training in certain specialties still adequate under duty hour limits—especially in procedural specialties? And, if some specialties are considering extending the length of training, what effect does this have on workforce and other concerns?
- Is the transition into real-world practice (in which duty hour limits do not apply) becoming more difficult for young physicians?
- Do residents learn to function in a sleep-deprived environment and to recognize and compensate for their limits?
- Has professionalism deteriorated?

RECOMMENDATIONS

The Council on Medical Education, therefore, recommends that the following be adopted in lieu of Resolves 3-6 of Resolution 327 (A-09) and Resolution 330 (A-09) and that the remainder of this report be filed.

1. That our American Medical Association continue to monitor the enforcement and impact of the Accreditation Council for Graduate Medical Education duty hour standards, as they relate to the larger issue of the optimal learning environment for residents, and monitor relevant research on duty hours, sleep, and resident and patient safety, with a report back no later than the 2011 Annual Meeting of the AMA House of Delegates. (Directive to Take Action)

2. That our AMA, as part of its Initiative to Transform Medical Education strategic focus, utilize relevant evidence on patient safety and sleep to develop a learning environment model that optimizes supervision, professionalism, communication, and teamwork as well as finding a balance between resident education, patient care, quality and safety, and a wholesome personal life for physician learners and teachers—with a report back no later than the 2012 Annual Meeting. (Directive to Take Action)

3. That our AMA (through the AMA *GME e-Letter* and other communications) encourage publication of studies (in peer-reviewed publications, including the ACGME's newly developed *Journal of Graduate Medical Education*) and promote educational sessions about a) the potential effects of the Institute of Medicine recommendations and b) the effects of duty hour standards, extended work shifts, handoffs and continuity of care procedures, and sleep deprivation and fatigue on patient safety, medical error, resident well-being, and resident learning outcomes, and disseminate study results to GME designated institutional officials (DIOs), program directors, resident/fellow physicians, attending faculty, and others. (Directive to Take Action)

4. That our AMA call for pilot programs and further research into protected sleep periods during prolonged in-house call and, until such research shows improved patient care and safety, encourage the ACGME to not adopt the IOM report's call for a protected sleep period, which could have significant unintended consequences for continuity of patient care and safety, as well as being difficult and expensive to implement and monitor. (Directive to Take Action)

5. That our AMA encourage the ACGME to allow appropriate flexibility for different disciplines and different training levels within the current ACGME maximum duty hour standards to best train residents for professional practice within their specialties while optimizing patient safety during their training. (Directive to Take Action)

6. That our AMA communicate to all Graduate Medical Education Designated Institution Officials, program directors, resident/fellow physicians, and attending faculty the importance of accurate, honest, and complete reporting of resident duty hours as an essential element of medical professionalism and ethics. (Directive to Take Action)

7. That our AMA ensure that medicine maintain the right and responsibility for self-regulation, one of the key tenets of professionalism, and categorically reject outside involvement by the Centers for Medicare and Medicaid Services or the Joint Commission and other state and federal government bodies in the monitoring and enforcement of duty hour regulations. (Directive to Take Action)

8. That our AMA urge the ACGME to include external moonlighting hours in the calculation of duty hours, as defined in the IOM report, and also to ensure increased financial assistance for residents/fellows, such as subsidized child care, loan deferment, debt forgiveness, and tax credits, which may help mitigate the need for moonlighting. (Directive to Take Action)

9. That our AMA collaborate with other key stakeholders to educate the general public about the many contributions of resident/fellow physicians to high-quality patient care; further the public should be made aware that residency/fellowship education offers trainees the opportunity to realize their limits (under proper supervision) so that they can competently and independently practice under real-world medical situations. (Directive to Take Action)

10. That our AMA urge that any costs of further duty hour limits be borne by all health care payers, and that any proposed changes to the ACGME standards have adequate funding allocated prior to implementation. (Directive to Take Action)

11. That our AMA encourage the American Osteopathic Association to monitor duty hours and related issues in collaboration with the ACGME. (Directive to Take Action)

Fiscal Note: $2500 for staff time.

REFERENCES

1. Mark R. Mercurio and Steven M. Peterec. Attending Physician Work Hours: Ethical Considerations and the Last Doctor Standing. *Pediatrics* 2009;124;758-762; originally published online Jul 5, 2009.

2. Open Letter to the GME Community. Accreditation Council for Graduate Medical Education. Available at: http://www.acgme.org/acWebsite/home/nascaletter_feb2009.pdf. Accessed July 10, 2009.

3. Ying He et al. The Transcriptional Repressor DEC2 Regulates Sleep Length in Mammals. *Science* 325 (5942), 866.

4. Thomas Nasca. Resident Issues Need Close Examination. *AAMC Reporter*. July 2009.

5. Teryl K. Nuckols, Jay Bhattacharya, Dianne Miller Wolman, Cheryl Ulmer, Jose J. Escarce. Cost Implications of Reduced Work Hours and Workloads for Resident Physicians. *N Engl J Med*. 2009 360: 2202-2215.

6. Melvin S. Blanchard, David Meltzer, Kenneth S. Polonsky. To Nap or Not to Nap? Residents' Work Hours Revisited. *N Engl J Med*. 2009 360: 2242-2244.

7. Christopher P. Landrigan, Amy M. Fahrenkopf, Daniel Lewin, Paul J. Sharek, Laura K. Barger, Melanie Eisner, Sarah Edwards, Vincent W. Chiang, Bernhard L. Wiedermann, Theodore C. Sectish. Effects of the Accreditation Council for Graduate Medical Education Duty Hour Limits on Sleep, Work Hours, and Safety. *Pediatrics* 2008 122: 250-258.

8. Jay Jagannathan, G. Edward Vates, Nader Pouratian, Jason P. Sheehan, James Patrie, M. Sean Grady, John A. Jane, Sr. Impact of the Accreditation Council for Graduate Medical Education work-hour regulations on neurosurgical resident education and productivity. Journal of *Neurosurgery* 2009 110:5, 820-827

9. Vineet M. Arora; Emily Georgitis; Juned Siddique; Ben Vekhter; James N. Woodruff; Holly J. Humphrey; David O. Meltzer. Association of Workload of On-Call Medical Interns With On-Call Sleep Duration, Shift Duration, and Participation in Educational Activities. *JAMA*. 2008;300(10):1146-1153.

10. Arezou Yaghoubian; Guy Saltmarsh; David K. Rosing; Roger J. Lewis; Bruce E. Stabile; Christian de Virgilio. Decreased Bile Duct Injury Rate During Laparoscopic Cholecystectomy in the Era of the 80-Hour Resident Workweek. *Arch Surg*. 2008;143(9):847-851.

11. Vineet Arora; David Meltzer. Effect of ACGME Duty Hours on Attending Physician Teaching and Satisfaction. *Arch Intern Med*. 2008;168(11):1226-1227.

12. Pauline Chen. Does More Sleep Make for Better Doctors? *The New York Times*. December 4, 2008. Available at: http://www.nytimes.com/2008/12/05/health/05chen.html. Accessed July 14, 2009.

13. Barron H. Lerner. A Life-Changing Case for Doctors in Training. *The New York Times*, March 2, 2009. Available at: http://www.nytimes.com/2009/03/03/health/03zion.html. Accessed July 14, 2009.

14. Sandeep Jauhar. The Nightmare of Night Float. slate.com, July 30, 2008. Available at: http://img.slate.com/media/57/08012008.htm#2196333. Accessed July 14, 2009.

15. Stephen Bergman. Valor and fear in surgeons. *Boston Globe*. October 13, 2008. Available at: www.boston.com/bostonglobe/editorial_opinion/oped/articles/2008/10/13/valor_and_fear_in_surgeons/. Accessed July 15, 2009.

16. John Ingle. Resident Work Hours: Standing Up for Patient Safety is Not Whining. *The Huffington Post*, December 19, 2008. Available at: http://www.huffingtonpost.com/john-ingle-md/resident-work-hours-stand_b_152458.html. Accessed July 14, 2009.

17. Jane R. Gilsdorf. The Disappearing Doctors. *Health Affairs*. 2008;27(3):850-854.

18. Bernard M. Jaffe. Path to an uncharted destination. *Surgical Rounds*, March 2008. Available at: http://www.surgicalroundsonline.com/issues/articles/2008-03_01.asp. Accessed July 14, 2009.

19. John K. Iglehart. Residents' Duty Hours and the IOM Report. *NEJM*. Available at: http://www.nejm.org/perspective-forum/residents-hours-report/. Accessed July 15, 2009.

20. Napping During Hospital Shifts. *The New York Times*. December 9, 2008. Available at: http://www.nytimes.com/2008/12/09/opinion/09tue3.html. Accessed July 15, 2009.

21. Our view on medical care: Sleep-deprived residents still pose risks for patients. *USA Today*. December 9, 2008. Available at: http://blogs.usatoday.com/oped/2008/12/our-view-on-med.html. Accessed July 15, 2009.

22. Opposing view: Teaching hospitals excel. *USA Today*. December 9, 2008. Available at: http://blogs.usatoday.com/oped/2008/12/teaching-hospit.html. Accessed July 30, 2009.

23. Shari Roan. Sleep loss a merit badge for doctors. *Los Angeles Times*. March 24.

24. Kathlyn E. Fletcher et al. How Do Hospitalized Patients Feel About Resident Work Hours, Fatigue, and Discontinuity of Care? *J Gen Intern Med*. 2008 May; 23(5): 623-628. Available at: www.pubmedcentral.nih.gov/articlerender.fcgi?artid=2324147&tool=pmcentrez. Accessed August 3, 2009.

25. Thomas L. Schwenk, Michael J. Brenner, Reto Auer, Drahomir Aujesky, Nicolas Rodondi, Michael M.E. Johns, Judah L. Goldberg, Stephen Sandroni, Melvin S. Blanchard, David Meltzer, Kenneth S. Polonsky. Residents' Work Hours. *N Engl J Med* 2009 361: 928-930.

26. Jacob Moalem, Peter Salzman, Daniel T. Ruan, Gregory S. Cherr, Carter B. Freiburg, Rachel L. Farkas, Luke Brewster, Ted A. James. Should All Duty Hours Be the Same? Results of a National Survey of Surgical Trainees. *Journal of the American College of Surgeons*. 2009 July; 209(1): 47-54.

27. Action on Patient Safety - High 5s. World Health Organization. Available at: http://www.who.int/patientsafety/solutions/high5s/en/. Accessed August 10, 2009.

28. Julie K Johnson and Vineet M Arora. Improving clinical handovers: creating local solutions for a global problem. *Qual Saf Health Care* 2009; 18: 244-245.

29. Vineet Arora, MD, MA; Carrie Dunphy, BS; Vivian Y. Chang, BA; Fawaz Ahmad, MS; Holly J. Humphrey, MD; and David Meltzer, MD, PhD. The Effects of On-Duty Napping on Intern Sleep Time and Fatigue. *Ann Intern Med*. 2006;144:792-798.

30. Teryl K. Nuckols, Jay Bhattacharya, Dianne Miller Wolman, Cheryl Ulmer, Jose J. Escarce. Cost Implications of Reduced Work Hours and Workloads for Resident Physicians. *N Engl J Med*. 2009 360: 2202-2215.

31. Lopez, Lenny; Katz, Joel T. Creating an Ethical Workplace: Reverberations of Resident Work Hours Reform. *Academic Medicine*. 2009: 84(3):315-319.

32. Jason D. Higginson. Limiting Resident Work Hours Is a Moral Concern. *Academic Medicine*. 2009: 84(3):310-314.

33. John D. Rybock. Residents' Duty Hours and Professionalism. *N Engl J Med* 2009 361: 930-931.