



Alliance for Academic Internal Medicine

330 John Carlyle Street, Suite 610
Alexandria, VA 22314
Telephone: (703) 341-4540
Fax: (703) 519-1893
Email: AAIM@im.org
Website: www.im.org

AAIM BOARD OF DIRECTORS

OFFICERS

Chair

Sara B. Fazio, MD
Harvard Medical School
Beth Israel Deaconess Medical Center

Vice Chair

Alwin F. Steinmann, MD
Saint Joseph Hospital

Secretary-Treasurer

Mark W. Geraci, MD
Indiana University School of Medicine

EX OFFICIO

President and Chief Executive Officer

D. Craig Brater, MD

Deputy Chief Executive Officer and EVP

Bergitta E. Cotroneo, FACMPE

BOARD MEMBERS

Brian M. Aboff, MD
Jefferson Medical College/
Christiana Care Health Services

G. Dodd Denton, II, MD
Ochsner Clinic Foundation

Masada "Musty" Habbab
University of Michigan Medical School

Timothy J. Heffer
University of Rochester
School of Medicine and Dentistry

Mary E. Klotman, MD
Duke University School of Medicine

Valerie J. Lang, MD
University of Rochester
School of Medicine and Dentistry

Lia S. Logio, MD
Weill Cornell Medical College
of Cornell University

James D. Marsh, MD
University of Arkansas
for Medical Sciences College of Medicine

L. James Nixon, MD
University of Minnesota Medical School

Joshua D. Safer, MD
Boston University School of Medicine

Robert F. Todd, III, MD, PhD
Baylor College of Medicine

Steve Vinciguerra
Medical University of South Carolina
College of Medicine

Patty W. Wright, MD
Vanderbilt University School of Medicine

Governance

Committee Chair

Gregory C. Kane, MD
Sidney Kimmel Medical College at
Thomas Jefferson University

February 1, 2016

Thomas J. Nasca, MD
President and Chief Executive Officer
Accreditation Council for Graduate Medical Education
515 North State Street
Suite 2000
Chicago, IL 60654

Dear Dr. Nasca:

On behalf of the Alliance for Academic Internal Medicine (AAIM), thank you for the opportunity to provide feedback regarding the Accreditation Council for Graduate Medical Education (ACGME) resident duty hour requirements.

AAIM represents department chairs and chiefs; clerkship, residency, and fellowship program directors; division chiefs; and academic and business administrators as well as other faculty and staff in departments of internal medicine and their divisions at medical schools and teaching hospitals in the United States and Canada.

As you requested, a formal position paper is attached to this letter. In summary:

- The Alliance applauds ACGME efforts to improve the learning and working environment for residents. We believe the duty hour requirements should be revised. Available evidence does not support the current mandates. In the future, high-quality studies are necessary to guide duty hour reforms.
- AAIM supports a less rigid approach to duty hour quantification and an effort to focus trainee and program commitment more deliberately on the quality of the resident working environment. AAIM recommends critical review and revision of the current restrictive duty hours, including the limitations of postgraduate year-1 residents to no more than 16 hours. We recommend allowing flexibility for training programs to adapt to local patient, clinical, and educational microsystems but with sufficient safeguards to ensure resident wellness.
- The Alliance believes a number of important components of the learning environment and working conditions could be leveraged to enhance and promote education and learning for physicians in training. Residents indicate that clinical activities that include opportunity for reflection and time to read coupled with appropriate supervision and support are highly positive to their education; in other words, it is not solely the activity but the time to learn that promotes education. Learning requires reflective practice or "diastole."
- AAIM believes that residents must have primacy of patient care (i.e., ownership, accountability, and responsibility) to drive learning. These elements are key to reinforce medical professionalism and vital for the development of altruism.

AAIM will be pleased to participate in the Resident Duty Hours in the Learning and Working Environment Congress, to be held in March 2016 in Chicago, IL.

Again, thank you for providing AAIM the opportunity to provide feedback about the resident duty hour requirements. If you have any questions or need additional information, please contact me at (703) 341-4540 or AAIM@im.org at your convenience.

Sincerely,

D. Craig Brater, MD
President and Chief Executive Officer

Resident Duty Hours: An Alliance for Academic Internal Medicine Position Paper

Introduction

The Alliance for Academic Internal Medicine (AAIM) is the consortium of five academically focused specialty organizations, which represents department chairs and chiefs; clerkship, residency, and fellowship program directors; division chiefs; and academic and business administrators as well as other faculty and staff in departments of internal medicine and their divisions at medical schools and teaching hospitals in the United States and Canada. As the nation's largest organization of academic internists, AAIM is uniquely positioned to comment on the Accreditation Council for Graduate Medical Education (ACGME) resident duty hour requirements.

AAIM commends ACGME efforts to improve the learning and working environment for residents. The Alliance supports the 2011 ACGME Task Force on Quality Care and Professionalism (1) goals to focus not only on the quantity of duty hours but also consideration of other important dimensions of resident duty hour requirements including resident supervision, professionalism, personal responsibility, patient safety, transitions of care, and work load considerations. Current data on resident duty hour standards is mixed; after careful review of the published literature, the Alliance asserts that the requirements have had no significant impact on improving patient safety or quality of care yet may have promoted worrisome negative trends in the resident learning environment.

The Alliance believes that ACGME standards regarding the learning and working environment should incorporate an understanding of its complex, interrelated nature. Flexibility in duty hour requirements, geographic units, interdisciplinary team-based assignments, and census limits adjusted for illness severity could potentially improve the recognized contributors to work complexity, work intensity, and work compression. The new framework for internal medicine should incorporate sufficient "diastole" to promote and enhance learning, with recognition of the factors that can both increase and decrease resident work. A deliberate effort to balance these factors to allow for the necessary learning and reflection is paramount.

AAIM believes that existing data are inconclusive, fragmented, and do not clearly support the current metrics of duty hour limitations. The Alliance encourages ACGME to evaluate the long term impact of duty hour limits and to continue to support rigorous study of outcomes for all stakeholders.

Current ACGME Resident Duty Hour Requirements: Costs and Impact of Implementation

AAIM recommends that ACGME critically review duty hour requirements and revise duty hour standards based on currently available evidence. The Alliance further recommends that ACGME perform or support high quality studies to address issues raised by duty hour reforms for better guidance on best practices in resident education.

Available evidence suggests a negative impact on the resident educational environment since the implementation of duty hour requirements in 2003. Admittedly, these data are neither systematic nor complete and in some areas sparse, but they represent the best available evidence. A systemic review and meta-analysis of eight time-motion studies of internal medicine residents showed that since the 2003 duty hour requirement reforms, resident time spent in educational activities decreased from 17.7% to 11.6% (2). In the largest of these performed after implementation of the 2011 duty hour requirements, residents spent only 12% of their time in direct patient care (3). In a qualitative assessment, residents also perceived a decrease in teaching and clinical experience after the implementation of 2011 requirements (4). In a 2012 survey of internal medicine program directors, 90% felt that there had been no improvement in resident education (5).

The implementation of the 2011 duty hour requirements has had no clear impact on improving resident wellness. An analysis of 27 studies with 41 separate analyses from multiple specialties published from 2010 to 2013 examining the outcomes of patient care, resident well-being, and resident education found that the duty hour restrictions had no impact on resident wellness in seven of 17 studies (41.2%) with an additional six (35.3%) demonstrating a negative impact on resident wellness. Additionally, nine of 14 studies (64.3%) showed a negative impact on resident education (6). Resident education garnered the highest proportion of unfavorable outcome followed by resident well-being. Ripp and colleagues assessed the impact of duty hour restrictions on job burnout in internal medicine residents pre- and post-2011 duty hour reform and found no significant change in prevalence (75% versus 84%, $P = .08$) or incidence (68% versus 81% $P = .07$) (7). Limited data are available on the influence of duty hour requirements on the educational deficits experienced by residents and on resident preparedness for independent practice or subsequent training (8).

The implementation of 2011 duty hour requirements has had no clear measurable impact on improving patient safety and quality outcomes. In a retrospective cohort study of adult medical patients at a public, university-affiliated hospital from 2010 to 2012, Denson and colleagues found that a trend toward higher mortality following resident handoffs remained after implementation of the 2011 ACGME duty hour amendments (9). Another study examined the impact on mortality and readmissions of Medicare patients between 2011 and 2013 and found no significant post-reform differences in mortality or in readmissions for combined medical conditions (10). Furthermore, there were no improvements in process-of-care and patient experience measures pre- and post-2011 duty hour reforms (11). There is no evidence that the duty hour changes have improved patient outcomes measured as preventable adverse events (PAEs) or experience, nor is there evidence that the increase in handoffs that occur with the duty hour changes has had a deleterious effect on patient outcomes or patient experience. Overall, the anticipated improvement in patient outcomes with restrictive duty hour limitations have not been realized. What evidence exists, however, suggests that resident education has suffered.

Justification for duty hour requirements has focused largely on learners and patients. The impact on faculty and institutions has largely been ignored, yet these two groups significantly contribute to and influence the educational and clinical environment. Data are extremely limited regarding these two stakeholders. A survey to assess how pediatric residency programs were adjusting to the new 2011 duty hour regulation showed that 23% of programs increased the number of

attending physicians in-house at night, 57% increased the number of pediatric hospitalist attending staff, and 37% increased the number of pediatric intensivists (12). Similar data do not exist for internal medicine. But if there are parallels across disciplines, it represents a huge institutional cost and additional staffing with downstream effects. These physicians could have been deployed elsewhere in the health system to address needs caused by physician workforce shortages. It is likely the pediatric experience is generalizable.

The duty hour requirements introduced in 2011 have increased direct costs for teaching hospitals by hundreds of millions of dollars (13). Interestingly, an analysis by Nuckols and Escarsce models the cost of increased manpower owing to duty hour restrictions relative to the savings due to hypothetical improved patient outcomes (13). The analysis suggests that if PAEs decline by 3%, the net societal cost will be in a range that may be societally acceptable. Current data suggest no decrease in PAEs meaning the additional workforce cost is unacceptable. One additional study estimates a cost of \$257.50 per patient-day to create non-teaching service coverage for patients no longer covered by residents because of fewer hours worked (14).

Duty hour reforms were necessary when implemented in 2003. However, existing data are inadequate and do not support the current 2011 restrictions. In fact, the inflexible duty hour requirements may be detrimental to a physician's professional development, limiting preparedness of physicians for independent practice and may favor the development of a shiftworker mentality as described in the work of Sun and colleagues (15).

Dimensions of Resident Duty Hour Requirements

AAIM supports the ACGME commitment to consider of multiple dimensions of resident duty hour requirements (1). Unfortunately, in practice, the focus at the program and learner level has been primarily on the recording and quantification of duty hours. No discernable improvement in patient outcomes or in educational outcomes are demonstrated in the literature.

In addition to the data referenced earlier, three additional studies are noteworthy. Lin and colleagues reviewed 72 high-quality studies; of these studies only 10 addressed issues of fatigue and resident well-being with two of the 10 showing a positive impact on resident quality of life, one showing a negative impact on resident mood and the remainder having no significant impact. Although two studies revealed resident well-being was generally improved, residents associated restricted duty hours with a perceived negative impact on education (16). Sen and colleagues surveyed 51 residency programs and found a self-reported decrease in total hours worked after the 2011 duty hour changes, but they found no improvement in depression, amount of sleep, and well-being. This study also demonstrated an unexpected increase in self-reported errors (17). Choma and colleagues retrospectively studied the impact of 16-hour versus 30-hour shift rules on non-ICU patients at a single institution. This study revealed an increase in the number of handoffs in the 16-hour group with no statistically significant difference in mortality, 30-day readmission, or PAEs (18).

A few studies examined the perceptions and impact of the duty hour changes on medical students. Williams and colleagues surveyed 67 third-year medical students; students exposed to shift-based schedules were less likely to perceive that their attendings were committed to

teaching (odds ratio [OR] 0.35, 95% confidence interval [CI]: 0.13-0.90, $p = 0.01$) or perceive that residents had sufficient exposure to assess their performance (OR 0.29, 95% CI: 0.09-0.91, $p = 0.03$) (19). Kogan and colleagues performed a survey of medical students and clerkship directors at 14 institutions before and after the 2011 duty hour changes. Students in this study believed patient care was more fragmented and clerkship directors perceived a negative impact on student teaching and feedback along with an increase in handoffs (20). Given medical students represent potential future residents, it remains vital to understand the impact of duty hour changes and the learning environment on their education.

Given the lack of substantive evidence that the 2011 changes improved the quality of resident education and patient care, AAIM supports a less rigid approach to duty hour quantification and an effort to focus resident and program commitment more deliberately on the quality of the resident learning and working environment (21).

AAIM favors continued support of:

- Maximum of 80 hours per week (averaged over a four week period). AAIM suggests that residents *should* not work more than 80 hours a week and *must* not work more than 80 hours a week averaged over a four week period.
- One day free of duty for every seven days (averaged over four weeks). AAIM suggests further study of the benefit of one day off per week compared to two consecutive days off in a one or two week period. The Alliance believes the two consecutive days off may favor resident wellness and diastole, especially in the era of remote access to electronic health records when “non-work” time is less assured (22).
- In-house call should be no more frequent than every third night.

The Alliance recommends a critical review of more restrictive duty hours, including the limitations of postgraduate year (PGY)-1 residents to no more than 16 hours. AAIM further recommends that ACGME allow flexibility for training programs to adapt to local patient, clinical, and educational microsystem needs.

AAIM recommends that ACGME continue to partner with other organizations to evaluate the long term impact of duty hour limits and continue to support research and study into outcomes for patients, residents—particularly educational outcomes and learner wellness—faculty, and institutions related to current and future modifications of duty hour requirements and the learning environment. Programs and their sponsoring institutions, with the support of ACGME, would be responsible for collecting data related to patients, residents, faculty and institutional outcomes to ensure the local environment and duty hours support safe, high quality patient care, resident education, resident and faculty wellness, and institutional goals. Data from sponsoring institutions should be provided to meaningfully inform local educational units and teams. AAIM would be pleased to continue the dialogue on the development of such metrics.

Standards Governing Key Aspects of the Learning and Working Environment

AAIM believes a number of important components of the learning environment and working conditions could be leveraged to enhance and promote education and learning for physicians in training. The single premise, supported by the evidence, is that residents identify education in

activities that include reflection and time to read coupled with appropriate supervision and support (23-25). Education requires “diastole.” In addition, it cannot be overemphasized that at a minimum, residents must have primacy of patient care (i.e., ownership, accountability, and responsibility) to drive their learning and work. It is key to reinforcing medical professionalism and for the vital development of altruism.

Multiple factors and structural components influence the environment, all contributing to the work conditions and the ability of teams to perform at their best. These components are complex in and of themselves but may be targets for deliberate design toward best practice in developing physician identity and professional competency.

AAIM recommends:

- Requirements for resident duty hours should be consistently applied to every level of learner to support the competency-based educational framework introduced by the milestones. In addition, in the final six months of training, residents may benefit from additional flexibility as they prepare for practice beyond training—when they will have to function without restricted duty hours.
- Admission and census caps should have flexibility to reflect the resident work conditions (patient complexity, geographic distribution, IT support, etc.) that are specific to each given service (ICU patients, geographically localized, etc.).
- Residents should not be required to perform routine clerical tasks, i.e. non-physician work, including but not limited to scheduling tests, procedures, patient appointments, or other non-clinical paperwork.
- Programs and their sponsoring institutions should facilitate real time, clear communication and coordination of care within a well-delineated inter-professional team.
- Faculty expectations should be clearly defined to limit responsibilities outside the scope of resident supervision and teaching when faculty are “on service” (inpatient) or precepting (outpatient). Schedules for faculty responsible for supervising and educating residents should be designed to maximize continuity of care for patients and enable sufficient exposure to residents to provide meaningful formative and summative evaluation, resident autonomy, and support.
- Programs and their sponsoring institutions must provide space and time to facilitate effective mechanisms that support learner resting strategies and promote fatigue management.

Work Conditions

The clinical learning environment is a complex adaptive system that can be better understood by Woods model of performance (26). This model hypothesizes that human and environmental factors can support or constrain high performance. Environmental factors include ambiguity, unpredictability, conflicting goals, and time pressures. At the organizational level, decisions, resources and constraints have an impact on the direct decisions of the care providers.

Internal medicine learners face high levels of all four environmental factors. Ambiguity and unpredictability naturally coexist with novice physicians learning to care for sick hospitalized or chronically ill ambulatory patients. But in addition to these potentially unavoidable aspects of

resident work, well-intended regulatory changes and local organizational responses to these changes may have caused numerous, often unanticipated, downstream effects on internal medicine residents. For example, regulating length of work shifts without decreasing workload has compressed resident work, added time pressures, and created conflicting goals of whether to comply with duty hour requirements or violate them to prioritize patient needs. Frequent interruptions can increase physician perception of workload (27), an outcome that may be improved with use of two-way communication devices (28). Coverage schemes and increased handoffs create increased ambiguity.

Moreover, work compression may adversely affect residency education without improving key resident or patient outcomes. Duty hour requirement changes over the last 15 years have not contributed to increases in reported sleep by residents or been associated with a decline in resident depressive symptoms or burnout (17). The inconsistency in the duty hour requirements among junior (PGY-1) and senior (PGY-2 and PGY-3) residents appears to generate more handoffs, introducing tension into the team dynamics, and has not enabled preparation for practice beyond training (29). Improving the learning environment, and subsequently improving patient care outcomes, requires a better understanding of the impact of work conditions on the environmental factors and how they affect faculty, residents, and patients.

Work conditions include structural elements such as geographic assignments, travel necessary between work locales, admission limits to services, team census, number of handoffs, number of patients per outpatient clinic session, and the type and complexity of patients. A single institution study from Mayo demonstrated improvement in resident-perceived “appropriateness” of work, conference attendance, and duty hour violations when team census and geography were specifically designed around the needs of the residents (30). Other studies show that not all patients count equally. For example, the proportion of new versus established patients matters as do the higher needs of patients in ICU or other monitored (step down) settings (31). Conversely, selectively admitting more severely ill patients to “teaching” services in the Mayo study was not associated with lower ratings of work appropriateness, demonstrating that increased patient complexity can perhaps be offset by lower patient volumes and/or increased work efficiency (30).

AAIM recognizes that every learning environment is different but believes there exists a tipping point that when reached, creates an inverse relationship between resident workload and education: factors that increase resident work decrease time available for education, reflection, and learning.

Factors That Increase Work	Factors That Decrease Work
<ul style="list-style-type: none"> • Total number of hours per week • Continuous hours worked • Number of nights • More transitions from night to day • Increased number of admissions/discharges • Increased severity of illness of patients • Higher team census and patient turnover 	<ul style="list-style-type: none"> • Higher percentage of patients geographically grouped • Existence of reliable, user-friendly CPOE and EHR • Quality and availability of transport, phlebotomy, IV services, clerical support, consultants

<ul style="list-style-type: none"> • Amount of non-physician work (transporting patients, IV services, phlebotomy, making follow up appointments, completing paperwork) • Lack of faculty supervision and timely support 	<ul style="list-style-type: none"> • Quality and availability of diverse patient-care team members to manage complex patients (social work, mental health, discharge planning, pharmacy, care management) • Non-teaching services to manage surges in patient volume • Improved communication mechanisms across spectrum of providers • Standardized sign out protocols • Appropriate faculty supervision and support
--	--

Culture of Teamwork and Supportive Environment

A number of the Alliance recommendations require a clearer definition of team members, roles, and expectations as well as improved communication among them. A culture of teamwork is critical and can be promoted through the ACGME Clinical Learning Environment Review process.

Today's chaotic health care environment palpably affects the faculty, who are subject to innumerable competing demands on their time and attention; these demands affect their teaching effectiveness (32). Despite their tremendous dedication to serve as teachers, mentors, and coaches to learners, they are also subject to productivity requirements, administrative tasks (billing), and additional patient care responsibilities outside of the teaching services. In the ambulatory setting, ACGME has defined a limit to faculty effort outside of the realm of their teaching role during a clinic session (33,34). AAIM recommends similar restrictions be put in place for hospitalists or other inpatient providers.

Studies on how residents conceptualize "service" and "education" suggest significant task overlap between these two categories. The opportunity to read, reflect, and synthesize patient interactions as well as receive feedback and observation from faculty often differentiated education from a task that was viewed as "service" (23-25). In other words, residents thrive in an environment where they are respected for their contributions to patient care and given clear expectations about performance, autonomy to make important patient care decisions, and supervision, feedback, and time for reflection to learn from these decisions and perfect their trade toward mastery. Studies of internal medicine residents suggest that these components of the learning environment may also mitigate resident burnout and fatigue (35,36). ACGME program requirements already include phraseology about creating a "supportive educational environment" for residents (37) but without specific measurable characteristics or defined consequences for failing to maintain this immeasurable but key component to the culture. Teaching hospitals should aim to create purposeful teams to deliver care to patients, including minimizing interruptions (38), and identify personnel to help with non-physician work. Strategies to eliminate duplicative effort across team members should be maximized.

Conclusion

AAIM supports duty hour limitations and the focus on improving the work and learning environment. The Alliance believes the current ACGME requirements have resulted in several unintended consequences that have negatively affected educational outcomes and patient care, without measurable improvements in patient care or resident wellness. Insufficient data about the justification for and the outcomes of duty hour limitations must be addressed as should the impact of these requirements on an increasingly complex and complicated learning and working environment. AAIM supports flexibility in the duty hour requirements; continued evaluation of the long term impact of duty hour limits and outcomes for patients, residents, faculty, and institutions; and deliberate definition of the factors that decrease resident work to make more time for education and preserved primacy of patient care (i.e., ownership, accountability, and responsibility) to drive learning. The Alliance hopes ACGME will preserve these important guiding principles as key aspects of any review and future success for the duty hour requirements.

Alliance for Academic Internal Medicine

References

1. *The ACGME 2011 Duty Hour Standards: Enhancing Quality of Care, Supervision, and Resident Professional Development*. Chicago, IL: Accreditation Council for Graduate Medical Education. 2011.
2. Leafloor CW, Lochnan HA, Code C, Keely EJ, Rothwell DM, Forster AJ, Huang AR. Time-motion studies of internal medicine residents' duty hours: a systematic review and meta-analysis. *Adv Med Educ Pract*. 2015;6:621-629.
3. Block L, Habicht R, Wu AW, Desai S, Wang K, Novello Silva K, Niessen T, Oliver N, Feldman L. In the wake of the 2003 and 2011 duty hours regulations, how do internal medicine interns spend their time? *J Gen Intern Med*. 2013; 28(8): 1042-1047.
4. Nevin CR, Cherrington A, Roy B, Daly DD, Rodriguez JM, Patel M, Snyder ED, Gaffo AL, Barney J, Willig JH. A qualitative assessment of internal medicine resident perceptions of graduate medical education following implementation of the 2011 ACGME duty hour standards. *BMC Med Educ*. 2014;14:84.
5. Garg M, Drolet BC, Tammaro D, Fischer SA. Resident duty hours: a survey of internal medicine program directors. *J Gen Intern Med*. 2014;29(10): 1349-1354.
6. Bolster L, Rourke L. The effect of restricting residents' duty hours on patient safety, resident well-being, and resident education: An updated systematic review. *J Grad Med Educ*. 2015;7(3):349-363.
7. Ripp JA, Bellini L, Fallar R, Bazari H, Katz JT, Korenstein D. The impact of duty hours restrictions on job burnout in internal medicine residents: A three-institution comparison study. *Acad Med*. 2015;90(4):494-499.
8. Jagannathan JI, 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.
9. Denson JL, McCarty M, Fang Y, Uppal A, Evans L. Increased mortality rates during resident handoff periods and the effect of ACGME duty hour regulations. *Am J Med*. 2015;128(9):994-1000.
10. Patel MS, Volpp KG, Small DS, Hill AS, Even-Shoshan O, Rosenbaum L, Ross RN, Bellini L, Zhu J, Silber JH. Association of the 2011 ACGME resident duty hour reforms with mortality and readmissions among hospitalized Medicare patients. *JAMA*. 2014;312(22):2364-2373.
11. Rajaram R, Saadat L, Chung J, Dahlke A, Yang AD, Odell DD, Bilimoria KY. Impact of the 2011 ACGME resident duty hour reform on hospital patient experience and processes-of-care. *BMJ Qual Saf*. 2015. E pub ahead of print.
12. Oshimura JM, Sperring J, Bauer BD, Carroll AE, Rauch DA. Changes in inpatient staffing following implementation of new residency work hours. *J Hosp Med*. 2014;9(10):640-645.
13. Nuckols TK, Escarce JJ. Cost implications of ACGME's 2011 changes to resident duty hours and the training environment. *J Gen Intern Med*. 2012;27(2):241-249.
14. Roy CL, Liang CL, Lund M, Boyd C, Katz JT, McKean S, Schnipper JL. Implementation of a physician assistant/hospitalist service in an academic medical center: Impact on efficiency and patient outcomes. *J Hosp Med*. 2008;3(5):361-368.

15. Sun NZ, Gan R, Snell L, Dolmans D. Use of a night float system to comply with resident duty hours restrictions: Perceptions of workplace changes and their effects on professionalism. *Acad Med*. 2015. E-pub ahead of print.
16. Lin H, Lin E, Auditore S, Fanning J. A narrative review of high-quality literature on the effects of resident duty hours reforms. *Acad Med*. 2016;91(1):140–150.
17. Sen S, Kranzler HR, Didwania AK, Schwartz AC, Amarnath S, Kolars JC, Dalack GW, Nichols B, Guille C. Effects of the 2011 duty hour reforms on interns and their patients: a prospective longitudinal cohort study. *JAMA Intern Med*. 2013;173(8):657–662.
18. Choma NN, Vasilevskis EE, Sponsler KC, Hathaway J, Kripalani S. Effect of the ACGME 16-hour rule on efficiency and quality of care: Duty hours 2.0. *JAMA Intern Med*. 2013;173(9):819–821.
19. Williams DA, Kogan JR, Hauer KE, Yamashita T, Aagaard EM. The impact of exposure to shift-based schedules on medical students. *Med Educ Online*. 2015;20:27434.
20. Kogan JR, Lapin J, Aagaard E, Boscardin C, Aiyer MK, Cayea D, Cifu A, Diemer G, Durning S, Elnicki DM, Fazio SB, Khan AR, Lang VJ, Mintz M, Nixon LJ, Paauw D, Torre DM, Hauer KEM. The effect of resident duty-hours restrictions on internal medicine clerkship experiences: Surveys of medical students and clerkship directors. *Teach Learn Med*. 2015;27(1):37–50.
21. Schumacher DJ, Slovin SR, Riebschleger MP, Englander R, Hicks PJ, Carraccio C. Perspective: Beyond counting hours: The importance of supervision, professionalism, transitions of care, and workload in residency training. *Acad Med*. 2012;87(7):883–888.
22. Deaño RC, DeKosky A, Appannagari A, Doll J, Georgitis E, Potts S, Arora V. Resident time spent in clinical and educational activities at home: Implications for duty hours. *Arch Intern Med*. 2011;171(11):1038–1039.
23. Galvin SL, Buys E. Resident perceptions of service versus clinical education. *J Grad Med Ed*. 2012;4(4):472–478.
24. Sanfey H, Cofer J, Hiatt JR, Hyser M, Jakey C, Markwekk S, Mellinger J, Sidwell R, Smink D, Wise S, Wohltman, Dunnington G. Service or education: In the eye of the beholder. *Arch Surg*. 2011;146(12):1389–1395.
25. Kesselheim JC, Sun P, Woolf AD, London WB, Boyer D. Balancing education and service in graduate medical education: Data from pediatric trainees and program directors. *Acad Med*. 2014;89(4):652–657.
26. Woods DD, Johannesen L, Cook RI, Sarter NB. *Behind Human Error: Cognitive Systems, Computers, and Hindsight*. Wright-Patterson AFB, Ohio; Crew Systems and Ergonomic Information and Analysis Center. 1994.
27. Weigl M, Müller A, Vincent C, Angerer P, Sevdalis N. The association of workflow interruptions and hospital doctors' workload: a prospective observational study. *BMJ Qual Saf*. 2012;21(5):399–407.
28. Ighani F, Kapoor KG, Gibran SK, Davis GH, Prager TC, Chuang AZ, Godley B. A comparison of two-way text versus conventional paging systems in an academic ophthalmology department. *J Med Syst*. 2010;34(4):677–684.
29. Drolet BC, Anandarajah G, Fischer SA. The impact of 2011 duty hours requirements on family medicine residents. *Fam Med*. 46(3):215–218.
30. Thanarajasingam U. Service census caps and unit-based admissions: Resident workload, conference attendance, duty hour compliance, and patient safety. *Mayo Clin Proc*. 2012;87(4):320–327.

31. Ward NS, Afessa B, Kleinpell R, Tisherman S, Ries M, Howell M, Halpern N, Kahn J, Members of Society of Critical Care Medicine Taskforce on ICU Staffing. Intensivist/patient ratios in closed ICUs: A statement from the Society of Critical Care Medicine Taskforce on ICU Staffing. *Crit Care Med*. 2013;41(2) 638-645.
32. Wingo MT, Halvorsen AJ, Beckman TJ, Johnson MG, Reed DA. Associations between attending physician workload, teaching effectiveness, and patient safety. *J Hosp Med*. 2016. E pub ahead of print.
33. Accreditation Council for Graduate Medical Education. A longitudinal continuity experience in which residents develop a continuous, long-term therapeutic relationship with a panel of general internal medicine patients (IV.A.2.c).1.(g). *ACGME Program Requirements for Graduate Medical Education in Internal Medicine*. Online. <http://www.acgme.org/acgmeweb/tabid/134/ProgramandInstitutionalAccreditation/MedicalSpecialties/InternalMedicine.aspx>. Accessed January 29, 2016.
34. Accreditation Council for Graduate Medical Education. Internal medicine residents must be assigned to emergency medicine (IV.A.2.c).1.(h). *ACGME Program Requirements for Graduate Medical Education in Internal Medicine*. Online. <http://www.acgme.org/acgmeweb/tabid/134/ProgramandInstitutionalAccreditation/MedicalSpecialties/InternalMedicine.aspx>. Accessed January 29, 2016.
35. Dyrbye L, Shanafelt T. A narrative review on burnout experienced by medical students and residents. *Med Educ*. 2016;50:132-149.
36. Friesen LD, Vidyarthi AR, Baron RB, Katz PP. Factors associated with intern fatigue. *J Gen Intern Med*. 2008;23(12):1981-1986.
37. Accreditation Council for Graduate Medical Education. Resident Duty Hours in the Learning and Working Environment (VI.A.2). *ACGME Program Requirements for Graduate Medical Education in Internal Medicine*. Online. <http://www.acgme.org/acgmeweb/tabid/134/ProgramandInstitutionalAccreditation/MedicalSpecialties/InternalMedicine.aspx>. Accessed January 25, 2016.
38. Fanucchi L, Unterbring M, Logio LS. (Re)turning the pages of residency: The impact of localizing resident physicians to hospital units on paging frequency. *J Hosp Med*. 2014;9(2):120-122.

Acknowledgement

AAIM thanks the writing group for its work to develop this position statement: Alpesh N. Amin, MD; D. Craig Brater, MD, President; John H. Choe, MD; Frances A. Collichio, MD; Bergitta E. Cotroneo, Deputy Chief Executive Officer; Lia S. Logio, MD, Writing Group Co-Chair; Maria Maldonado, MD; James D. Marsh, MD; Caroline Milne, MD; Isitri Modak, MD; John P. Moriarty, MD, Writing Group Co-Chair; Polly Parsons, MD; Sara L. Swenson, MD; Bipin Thapa, MD; and Gopal Yadavalli, MD.