EDITOR'S INTRODUCTION

Beginning a Dialogue with the Graduate Medical Education Community

On December 2, 2008, the Institute of Medicine (IOM) released its long-awaited report on resident duty hours.[1] In response, the ACGME has initiated a dialogue with its constituents and the educational community, to begin the process deliberating on the next version of the ACGME common and specialty duty hour standards, as well as the enhancements to the systems to promote compliance.

The IOM report and its recommendations reference the science on sleep loss and performance as the justification for the proposed standards. Articles in this issue of the *ACGME Bulletin* are dedicated to the complex issue of competing goods in the learning environment. The aim is to contribute to the dialogue about how to best balance safe, humane education of residents and learners, comprehensive and timely patient care, in which residents have a significant role. It also seeks to explore the education that is needed to produce proficient physicians, ready for independent practice at the completion of residency.

The CEO's column contributes to this by emphasizing the need to test new ways to produce validated "best approaches" for providing care and ensuring education under reduced resident hours. Lister and Friedman describe a drop in board performance for neurological surgery residents at one institution, and hypothesize about its causes, including the potential role of reductions in resident duty hours for this cohort of learners. Benjamin Levy, David Sklar and colleagues report the results of a resident retreat at the University of New Mexico, asking residents to identify opportunities for improvement. The findings suggest that residents viewed staff shortages and emergency department overcrowding as more serious patient safety concerns than work hours and fatigue, and the article also describes the innovative process to respond to the residents' suggestions for improvement.

Barbara Joyce describes an active partnership between graduate medical education and institutional departments of quality and safety, as a way to meaningfully study and adopt national and institutional quality improvement efforts into resident education. The articles by Jack Contessa, Diane Hartmann and Usha Satish give testimony to the richness and complexity of the learning environment in which resident education occurs, and to the commitment to excellence and continuous improvement in resident education. ∎

[1] Institute of Medicine. *Resident Duty Hours: Enhancing Sleep, Supervision, and Safety.* Washington, DC: The National Academies Press, 2008.

Duty Hours and Patient and Resident Safety: Three Principles, a Research Agenda, and a Caution

Thomas J. Nasca, MD, MACP , Ingrid Philibert, PhD, MBA

In their commentary in the September 9, 2008 medical education issue of the *Journal of the American Medical Association,* Drs. Volpp and Landrigan suggested eight principles to guide efforts to restructure resident duty hours.[1] Many of them are consistent with the Accreditation Council for Graduate Medical Education's efforts to set and enforce duty hour standards to promote patient safety, learning and resident well-being. They include emphasis on faculty supervision, focus on educational outcomes, and acknowledgement of the need for scientific study of refinements to the current standards.

In the five years since the institution of the common duty hour standards, the ACGME has developed a systematic approach to ensuring compliance with the duty hour standards.

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In addition to periodic accreditation site visits for all programs, this includes an annual resident survey to monitor duty hours, a formal system to respond to complaints about duty hour violations. The ACGME also requires education to increase residents' and faculty physicians' knowledge about the adverse consequences of fatigue and countermeasures to maintain alertness. In addition, through the institutional requirement, the ACGME vests responsibility for duty hour monitoring and oversight with the sponsoring institution, with assessment during institutional reviews.

The aim of this approach is continuous improvement in compliance. In the five years since the institution of the common duty hour standards in 2003, programs and sponsoring institutions have made continuous gains in adhering to the common and specialty-specific duty hour standards. For the past four years, each successive ACGME resident survey has demonstrated a reduction in the number of residents who report non-compliance with the duty hour standards.[2] For programs where the survey data indicate that a significant number of residents work beyond the duty hour limits, the ACGME initiates rapid follow-up including immediate site visits accompanied by focused institutional reviews.[3]

While many of Volpp and Landrigan's recommendations are sound, a few could result in the implementation of untested approaches without the scientific study warranted by the complexity of the interface between residents hours and other factors that promote safe care and good learning. To avoid this outcome, we suggest three principles to guide the redesign of resident hours.

First, accreditation and regulation must be based on current validated practice. Second, the study of duty hour limits must use accepted principles of ethical and scientific research. Third, lessons learned in other high-reliability industries that have addressed fatigue should be used in modification of resident duty hours regulations. Many of these industries have progressed beyond the blunt tool of regulating hours to efforts to promote alertness and safety at the system and individual level.

We also propose an initial research agenda for refinement and expansion by the educational community and the experts on regulation of duty hours in high-reliability settings.

Sound research and validated practice

Basing new accreditation standards on current, validated practice or the experience of best performing institutions was the approach taken by the ACGME in 2002, when it set the duty hour limits that became effective in 2003, using best available evidence. This included the experience of New York State, which accounts for 15% of the nation's residents and instituted duty hour limits in the late 1980s, and the experience of the ACGME accredited medical and surgical specialties that had instituted a weekly limit prior to 2002. Proposed reductions in weekly and continuous hours also should be based on the best available evidence.

The commentary cites several studies and one meta-analysis as support for a reduction in the length of the continuous duty period. Yet the only true prospective trial of a continuous duty period shorter than the current ACGME limit is a study of 21 first-year residents in the intensive care units of a single elite teaching hospital. This raises questions about generalizability and practical and educational utility. Among these questions are whether an intensive care setting is the optimal place for first year residents to learn clinical medicine, and whether reliance should be placed on their contributions to clinical care in this high-acuity, high-intensity environment. An additional concern is that this model, while widely cited, was discontinued in the setting where it was studied, and does not appear to have been adopted by other hospitals. Broader experience with this model across a range of teaching hospitals would be important to allow it to qualify as a validated best practice to serve as the approach for accreditation or regulation. Finally, the recommendation for shortening the continuous duty period fails to consider that many programs already use a form of this – night float – with studies showing that it does not completely alleviate fatigue, and through a combination of this and the need for added hand-offs may actually increase the risk of adverse events.[4,5]

Randomization to interventions to reduce resident hours, important in accumulating scientific knowledge, must be based on programs and institutions volunteering to test the benefits of new approaches, and must be conducted under the auspices of an institutional review board (IRB). While this may increase the time for testing new models, including interventions to reduce the length of the continuous duty period, any other approach to randomization would violate current principles of ethical investigation. Accreditation must not prevent innovation from occurring, but neither should it require the implementation of approaches that have not been adequately validated. The fact that European nations have instituted shorter duty hours cannot serve as validation, due to significant differences in the organization of graduate medical education, including open-ended education programs after graduation from medical school, as well as significant differences in acuity and in patient expectations.

Going beyond blunt approaches

Limits on resident hours are important to patient safety and to allowing residents to have the time and energy for learning, and the standards ACGME instituted in 2003 have reduced the incidence of residents working beyond limits advisable from a sleep and performance perspective. At the same time, duty hour limits alone represent a blunt strategy that does not consider the nuances of specialty, setting or individual response to sleep loss.

Other high-reliability industries use limits on workers' hours as one of a host of approaches to ensure safety. Volpp and Landrigan acknowledge this by suggesting a need to test clockwise shift rotation, shift overlaps and reorganizing the flow of patients and their assignments to residents and teams, yet they provide an incomplete list of interventions to promote alertness and safety and quality of care in teaching settings.

A research agenda

Volpp and Landrigan propose large scale studies of reduced duty hours to assess their effect on patient safety. This recommendation has been made even more important by the December 2, 2008 release of the comprehensive report of the Institute of Medicine's consensus committee on resident hours.[6] Such research will be important to base changes in the standards and other approaches to enhance learning and patient safety on solid knowledge about their benefits. Realist review formally assesses the existing literature and other data to explore, in ways that take into consideration differences among settings and nuances in the implementation.[7] The goal is not "generalizability" across a range of settings, but exploration of what works for whom, in what settings and in what contexts. This will be vital to testing elements of the IOM recommendations for their benefits and potential negative consequences in different specialties and settings. The ACGME has begun an extensive study that seeks to compile this evidence, with a focus on utility, applicability and acceptance within and across specialties and settings.

Potential interventions include specialty specific refinements to the standards that are sensitive to differences in learning needs among specialties, and the role patient care has in preparing residents for independent practice. Other approaches that go beyond finding the optimal limits on resident duty hours include changes in the physical environment, technology to reduce reliance on cognitive functioning and memory, and use of naps, exercise and other alertness-promoting strategies applied at the individual level. This should include applying and adapting knowledge gained in other high-reliability industries, such as data that 40-minute mandatory naps for long-haul pilots on average result in 26 minutes of sleep.[8] Finding the right interventions will mean exploring what

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changes would promote alertness at the individual level and safety at the system level, and how these could augment the duty hour limits. For some interventions, such as patient hand-offs, the optimal approach is not new standards but models that assist programs in implementing better approaches. For others, like simulation, to allow some important learning to occur away from the patient, standards may ultimately be helpful. In this regard, the Residency Review Committees in two specialties – Internal Medicine and Surgery – recently have added language about simulation to their program requirements.

Some interventions to promote safe care and good learning may require alterations in practices in teaching institutions that have become deeply ingrained in "how care is provided," and the significant role learners as providers play in the nation's health care institutions. This necessitates formal acknowledgement that duty hour limits alone are not sufficient to overcome structural problems in many teaching settings, resulting from the reality that the work efforts of residents may be used by some institutions to substitute for adequate safety infrastructure and expert staffing.

The work of developing a comprehensive research agenda will benefit from the involvement of the larger graduate medical education community, as well as experts on sleep and human performance. We encourage the educational community to join the ACGME in developing and refining a research agenda, with the ultimate goal of creating safe systems of care and excellence in resident learning.

Concern over resident educational outcomes and patient safety, now and in the future

It is imperative that resident education is conducted in a fashion that assures the safety of the patients entrusted to the care of the learner. Equally important, however, is the responsibility of our educational programs to produce the educational outcomes in our residents and fellows that assure the safe and superior provision of patient care to those they serve in the future, after graduation from the nurturing environment of our closely supervised educational programs. There are comments from many segments of the graduate medical education community that unintended consequences are resulting from current duty hour standards. These range from concerns over the adequacy of the development of clinical and operative judgment in graduates of general surgery residency programs, and erosion of the sense of duty among some residents in the medical disciplines. These concerns must be recognized, understood and, if validated, addressed in new standards.

The mission of the ACGME is to enhance the quality of patient care through improvements in graduate medical education. Further changes in duty hours must clearly take into account the safety and quality of patient care rendered in our teaching hospitals now. However, we must also study, understand, and enhance the quality of care rendered by our current residents in the future through assurance that our structures, requirements, and training programs enhance educational outcomes for our residents. We must recognize the significant differences between groups of specialties, their unique learning needs, and practice requirements. All these elements must be addressed as we re-examine the many questions and issues raised by resident duty hour regulation. ∎

[1] Volpp JG, Landrigan CP, Building Physician Work Hour Regulations from First Principles and Best Evidence. *JAMA,* 2008; 300(10):1197–99.

[2] Accreditation Council for Graduate Medical Education. Resident Survey Data for 2004 through 2008, ACGME, Chicago, IL.

[3] Nasca T. Special Message from the Chief Executive Officer Accreditation Council for Graduate Medical Education to all Program Directors, Designated Institutional Officials, and Residents. Standard Approach to Programs across All Specialties with Potential Duty Hour Violations Identified in the Resident Survey, September 18, 2008. http://www.acgme.org/acWebsite/home/SpecialMessageCEO2008Sept22.pdf, Accessed Dec.1, 2008.

[4] Cavallo A, Ris MD, Succop P. The night float paradigm to decrease sleep deprivation: good solution or a new problem? *Ergonomics,* 2003; Jun 10; 46(7):653–663.

[5] Kellogg KC, Breen E, Ferzoco SJ, Zinner MJ, Ashley SW. Resistance to change in surgical residency: an ethnographic study of work hours reform. *J Am Coll Surg,* 2006; 202(4):630–6.

[6] Institute of Medicine. *Resident Duty Hours: Enhancing Sleep, Supervision, and Safety.* Washington, DC: The National Academies Press, 2008.

[7] Pawson R, Greenhalgh T, Harvey G, Walshe K. Realist review – a new method of systematic review designed for complex policy interventions. *Journ Health Serve Res Pol,* 2005; 10 Suppl. 1:21–34.

[8] Rosekind MR, Graeber RC, Dinges DF, Connell LJ, Rountree MS, Spinweber CL, Gillen KA. *Crew Factors in Flight Operations IX: Effects of Planned Cockpit rest on Crew Performance and Alertness in Long Haul Operations.* NASA Technical Memorandum 108839. Moffett Field, CA: NASA Ames Research Center, 1994.

An Unexpected Observation of Board Scores Since Implementation of Common Duty Hours

J. Richard Lister, MD, MBA, William A. Friedman, MD

Since July 1, 2003, the date of implementation of the Accreditation Council for Graduate Medical Education's common duty hour standards, much has been written as to the effects, perceptions, impacts, and outcomes of the mandate. Reports of qualitative research on duty hours are numerous. The impact of the duty hour standards on the health and well being of the patient and the resident has received considerable attention. The scientific basis behind the duty hour's reform was to reduce the effects of sleep loss on cognitive performance and thus resident performance.[1] Arguments both for and against the new duty hour limitations arose and continue to arise across the spectrum of graduate medical education. On the ACGME web site, Ingrid Philibert, PhD, MBA, Senior Vice President of Field Activities, has published an annotated bibliography, entitled *Selected Articles on Resident and Physician Work Hours*. This sizeable review, recently updated in August 2008, numbers 167 pages. Upon review of this comprehensive list, we are unable to find any report of two interesting observations, which at least in part call into question the universality of improvement in resident performance since the implementation of duty hour standards.
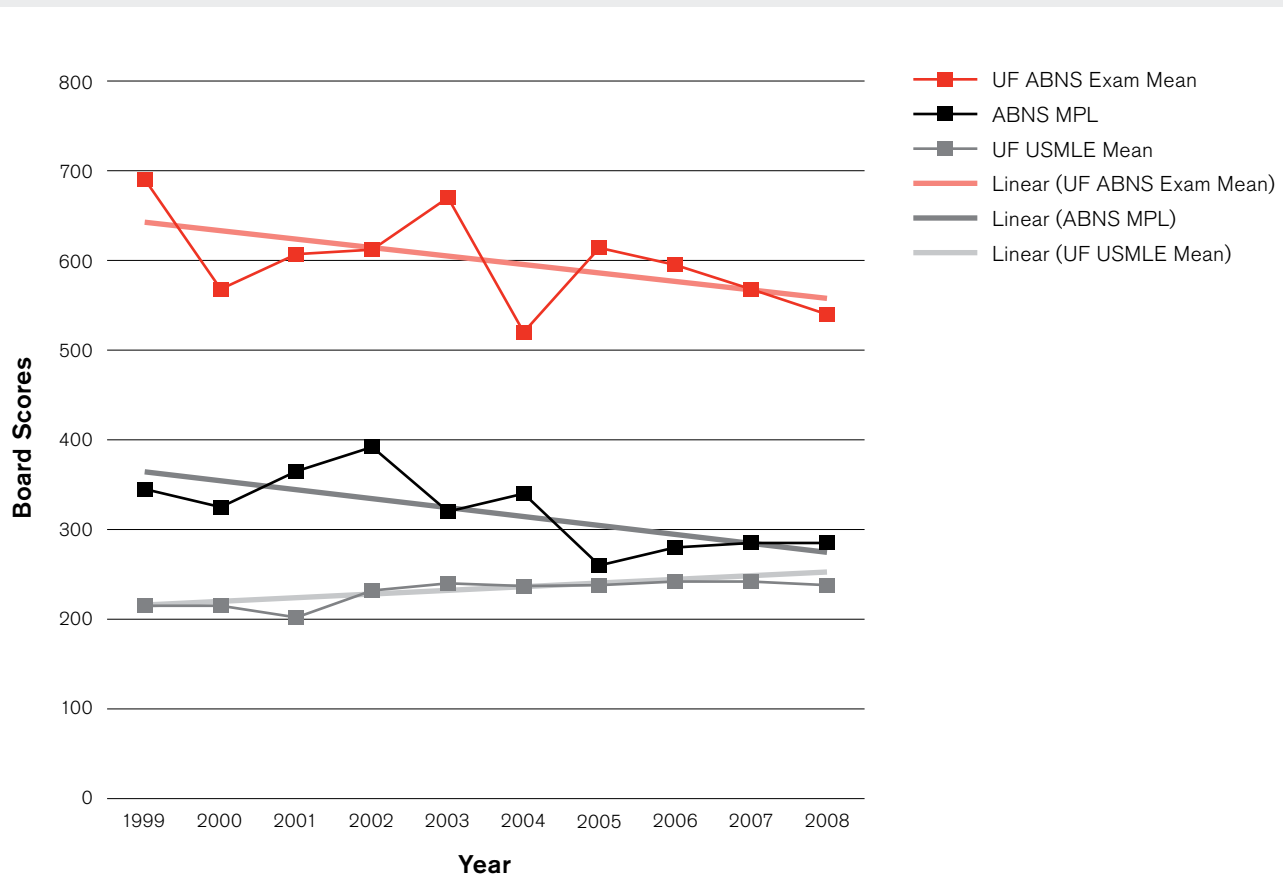
> **"We have noted a progressive diminution of the mean score of our residents when taken for credit in the five years since July 1, 2003 as compared to the 5 years leading up to July 1, 2003."**

Our observations deal with the results of the Primary Examination of the American Board of Neurological Surgery. We have noted a progressive diminution of the mean score of our residents when taken for credit in the five years since July 1, 2003 as compared to the 5 years leading up to July 1, 2003 (see *Exhibit 1*). A steady drop in the minimum pass level for the examination mirrors this downward trend.

The primary examination, prepared by the ABNS, covers topics in fundamental clinical skills, critical care, neuroanatomy, neurobiology, neurology, neuropathology, neuropharmacology, neuroradiology, neurosurgery, and other relevant disciplines deemed suitable and appropriate by the Board. The examination is open to all residents in ACGME-accredited neurosurgical programs and to neurosurgeons who have successfully completed such training. Residents may

take it either for credit toward certification or self-assessment, as determined by his or her Program Director. A resident's training is not complete and as such cannot receive a Program Director's endorsement until he/she passes the examination when taken for credit. As this examination is a reliable and valid instrument to measure the status of a resident's progression in the ACGME Outcomes Project Medical Knowledge core competency, we require residents at each training level to sit for the exam annually. In 2005, a national survey was conducted seeking the perceptions of residency program directors and residents in Neurosurgery training programs as to the effects of ACGME common duty hour standards.[2] The survey results suggested that the majority of residents and program directors felt the ACGME duty hour guidelines had a negative effect on their training programs. Of particular interest in this report was the question as to whether duty hour reforms would result in improved scores on the ABNS Primary Examination. At that time, only 33% of program director's predicted there would be improvement as opposed to 55% of resident responders. Recently, Dr. John Jane reported another survey of program directors and chief residents at the annual meeting of the American Academy of Neurological

Surgery. This survey revealed the overwhelming majority of respondents thought that duty hour reform had negatively affected residency education.[3]

Certainly, the cause of reduction in scores is likely to be multi-factorial. We hypothesized that one factor could not be attributed to the observed decline in our program scores – a decline in the intellectual capabilities of our matriculating residents. We chose to look at the United State Medical Licensing Examination Step I scores as objective measure of performance to compare the intellectual capabilities of the two resident cohorts. As with the ABNS Primary Examination, Step 1 is a demanding assessment of a candidate's ability to understand and apply important concepts of the sciences basic to the practice of medicine, with special emphasis on principles and mechanisms underlying health, disease, and modes of therapy. Step 1 ensures mastery of not only the sciences that provide a foundation for the safe and competent practice of medicine in the present, but also the scientific principles required for maintenance of competence through lifelong learning. We found the Step 1 scores of our residents did not decline from 2003 to 2008 but actually showed a steady rise over the entire 10-year period (mean 228 prior to

2003 and 246 subsequent to 2003). When we correlated the USMLE Step 1 scores with the ABNS for credit scores of the groups from 1999–2003 and 2003–2008, we found a drop in the Pearson Correlation Coefficient from .48 to .28 (see *Exhibit 1*). Using the USMLE Step 1 and ABNS Primary examinations as measures of matriculant intellectual capability, the declining correlation may suggest a training effect.

In a personal communication with Dr. Philibert, we have learned that at least one other specialty – Pediatrics – appears to experience a downward trend in their board performance

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at the national level; this trend occurring earlier for programs in New York state, which experienced limits on resident hours by state regulation prior to 2003. While the numbers of examinees represented by our program is small, it does seem to make a case for looking at such a trend from a national perspective. If the common duty hours were implemented to facilitate improvement in resident performance and if written examinations of respective medical specialty boards are valid and reliable instruments to test medical knowledge, then there appears to be a disconnect between expected and observed outcomes for this metric. At the same time, the limited sample from a single institution makes general inferences from this data problematic. Further research is needed to explore the factors that contribute to the observed reduction in board performance, with the aim of addressing the causes and ensuring high quality in the graduates entering neurological surgery practice. ∎

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[1]Friedman WA. Resident Duty Hours in American Neurosurgery. *Neurosurgery,* 54:925–933.

[2]Cohen-Gadol AA, Piepgras DG, Krishnamurthy S, Fessler, RD. Resident Duty Hours Reform: Results of a national Survey of the Program Directors and Residents in Neurosurgery Training Programs. *Neurosurgery,* 56:398–403.

[3]Jane JA Sr. Verbal Communication, American Academy of Neurological Surgery, Annual Meeting, September 2008.

One Small Step for Faculty Development

Jack Contessa, PhD

The Hospital of Saint Raphael (HSR) is a full-service community teaching hospital located in downtown New Haven, Connecticut. The hospital has accredited residency programs in general surgery, internal medicine, transitional year, oral and maxillofacial surgery, and radiology, along with fellowships in nephrology, gerontology and cardiovascular diseases. The general surgery residency program at the institution has approximately 35 faculty members that work with and supervise the program's 24 surgical residents. Nearly one-third are employed by the hospital and about two-thirds are private practice surgeons located in New Haven and surrounding communities. A majority also have surgical privileges at the other hospital in the city – Yale–New Haven.

By its very nature, the domain of surgery often requires surgeons to be tethered to the OR for hours at a time. Added to that is the variability of community physicians' schedules. Collectively, these factors make it challenging to create an educational forum where the majority of faculty can gather and be apprised of the numerous and substantive changes in residency training requirements that have taken place recently.

To overcome this challenge, we opted to pursue a "distance learning" electronic communication strategy as one of several strategies to enhance communication and ongoing education. Out of this, a bulletin for faculty of the general surgery residency program entitled "The Cutting Edge" was born. We explained in our inaugural issue that the goal was to present as succinctly as possible items important to success of the residency program and the faculty involved in it. We created the Bulletin as a single page, reader-friendly document, keeping in mind the premium of faculty time and the desire not to overburden them with yet another piece of paper to read.

We decided to publish the Bulletin bi-monthly and make the lead headline story of each issue one of the ACGME competencies. For the first year at least, this seemed to make the most sense – six competencies, six issues per year. For the secondary story headline, we described practical teaching techniques (an item generated by our faculty needs assessment). We selected the software Microsoft® Office Publisher to create the Bulletin since it has a number of colorful, engaging and easy to use templates and, like other Microsoft® Office Products, has a similar look and feel that flattens out the learning curve for novice users. The specific layout we chose is titled Watermark, and is configured for a lead story headline (ACGME Competencies) and a secondary story headline (teaching tips and other items of note).

In the spring of 2008 we launched our inaugural issue of "The Cutting Edge." Using our residency management software, we sent copies electronically to all faculty members, including site directors who oversee residents' extramural rotations. Because not everyone has Microsoft® Office Publisher, the Bulletin is also converted to a PDF document and faculty receives both formats. To maximize visibility, we also placed copies at Grand Rounds presentations, in the physicians' lounge, and mailed copies to their offices.

Almost immediately we received feedback about the high quality and value of the Bulletin. One of the initial techniques we presented was the concept of "wait time," the time that an instructor pauses following a question he or she asks. Feedback indicated faculty were willing to experiment with this notion, which demonstrates positive learning outcomes when instructors "wait" at least three seconds after asking a question before calling on a resident to answer.

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It's still early in our initiative, and to date we have published only four issues of "The Cutting Edge" with the remaining two issues due in November and January. Before the first year's cycle is complete, we plan to solicit faculty feedback to assess the impact of this publication and also to request ideas for a theatre for next year's Bulletin.

We recognize that this initial effort is just a "stake in the ground" and one small step toward developing a comprehensive solution to a challenging problem. However, we believe that we can build on this small success and use it to shape a more inclusive and meaningful faculty development program. ∎

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Building Bridges: Linking GME with Quality and Safety – an Institutional Perspective

Barbara Joyce, PhD

Background

Forming active partnerships between GME and institutional departments of quality and safety provide exciting and robust opportunities to meaningfully incorporate national and institutional quality and safety initiatives into resident training. In many institutions, departments of graduate medical education and departments of quality and safety operate independently of each other, with little interaction. Building bridges between these departments can enhance resident and physician training and improve patient care outcomes. Bridging the existing gap between GME and departments of quality and safety requires that we acknowledge and applaud each others' strengths and search for ways to form active partnerships. This article describes "Building Bridges: Linking GME and Quality and Safety", an institutional curriculum in Interpersonal and Communication Skills, designed to blend resident training with national and institutional quality and safety initiatives.

Many residency programs and institutional GME departments are actively partnering with their departments of quality and safety. These partnerships incorporate quality improvement projects and knowledge of the PDSA cycle into resident training as part of training in Practice-based Learning and Improvement. In addition, many residency programs and institutions are working on improving transitions of care by developing standardized hand-off procedures, such as checklists or electronic hand-off forms. In Systems-based Practice, residency programs and institutions have improved and expanded Morbidity & Mortality Conferences to include analysis of systems issues that led to the event, discussion of team communication issues that contributed to the event, and identification of the necessary system changes to prevent the unanticipated event or error from re-occurring. Hann et al.[1] described an innovative process to link tiered clinical outcome data with resident evaluation and educational program improvement. Their approach encouraged program directors, faculty, and residents to become familiar with national, specialty-specific, and institutional quality outcome data, and to use this data in a meaningful way to drive educational change and evaluate resident performance.

Progress has been made incorporating quality and safety initiatives into Practice-based Learning and Improvement and Systems-based Practice curriculum. The competency domain of Interpersonal and Communication Skills remains an area where more focused and integrated work can be done. Rich opportunities exist to design institutional Interpersonal and Communication curriculum around national initiatives from many different quality and healthcare organizations. The Joint Commission identified communication problems among

health care professionals providers, and between these professionals and patients and their families as a significant contributor to sentinel events.[2] National Quality Forum recommended the use of "teachback" during informed consent as a method of improving clear communication between providers and patients or their families.[3] Many organizations encourage hospitals and residency programs to adopt standardized hand-off techniques to reduce loss of critical patient information during transitions of care. Encouraging healthcare professionals to feel comfortable communicating up the chain of command is another example of a communication skill set that may reduce sentinel events. In the current climate of greater transparency in healthcare, many national organizations (Joint Commission, NQF) and healthcare systems are asking physicians to disclose errors and unanticipated events to patients and their families. Team training, crew resource management, and in situ simulation are also methods used in medical education to improve the communication between healthcare providers.

Linking GME and quality and safety

In designing our institutional curriculum we reviewed national initiatives, our own institutional initiatives in quality and safety, as well as the ACGME accreditation requirements for Interpersonal and Communication Skills. We blended these together to form our final curriculum.

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The Henry Ford Institutional Curriculum Committee was composed of program directors, residents, medical educators, VP of Medical Education, as well as leaders from the Department of Quality and Safety, Service Excellence, Nursing Development, and our online university. We met over the course of two months to review and decide which topic areas linked best with national quality and safety initiatives and our system initiatives' and discussed how we might capitalize on educational resources already developed by the Department of Quality and Safety. The group felt that the following six areas in communication skills warranted systematic educational training for all incoming first year residents in core residency programs: Informed Consent, Disclosure of Errors, Teamwork (including a standardized method for hand-offs, communicating up the chain of

command and crew resource management), Delivering Bad News, and Delivering Feedback to Learners. Communication scripts (e.g. specific trigger statements) and/or mnemonics were developed for each module and were designed to give the learner language to begin these difficult conversations.

An online module was created that provided foundational knowledge in each of the six topic areas. In these online modules, the communication "scripts" were described and residents were asked to view a video of a senior staff physician conducting an informed consent, disclosing an error, or delivering bad news to a patient. Videos in the teamwork modules included examples of hand-offs done well or challenges which might occur in communicating up the chain of command. In addition, each online module conveyed broader information related to national or system safety initiatives about why developing this particular skill set was important. For example, in the error disclosure module, residents reviewed material on their ethical obligation to disclosure error as well as reviewed summaries of national initiatives related to error disclosure. In the informed consent module, residents reviewed the importance of "teachback" and use of everyday language. This information formed part of an informed consent discussion as well as raised residents' awareness of health literacy.

Residents were required to complete the online module prior to a small group discussion and an OSCE experience. A structured small group discussion designed to deepen residents' understanding and application of the communication scripts and concepts was led by their program director or faculty champion. These small group discussions focused on helping residents and faculty discuss specialty-specific scenarios related to the above topics. The small group discussions also served to engage the learner in more deliberate learning around these communication skill sets.

After the small group discussion, residents completed three OSCEs related to the topic area. The OSCE scenarios were constructed from sentinel events that occurred at our hospital and were formative in nature. At the completion of this experience, residents completed a self assessment and rated their self efficacy for the specific communication skill sets. Standardized patients also completed an assessment of resident performance. Because OSCEs were videotaped, the resident's faculty mentor was able to review all assessments, discuss with the resident their performance and opportunities for improvement. This also provided faculty with critical knowledge of their resident's communication skills sets early in the resident's first year.

The institution also conducted faculty development for program directors and attending physicians. The focus of the faculty development sessions was to explain the initiative. An unintended consequence of this curriculum was that faculty gained skills in these specific communication skill sets by virtue of having to teach the topic.

Conclusions

"Building Bridges" was an institutional curriculum designed to teach important communication skill sets to all first year core residents that linked to national and institutional safety initiatives. The use of communication "scripts" helped residents learn the "beginning language" to initiate these difficult conversations. Partnering with our Department of Quality and Safety allowed us to use some already developed material, diffuse out institutional initiatives, and meet ACGME

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accreditation requirements for Interpersonal and Communication Skills. A current research program is underway to analyze the effect of this training on resident self-assessment and resident performance on the OSCEs. We are also identifying patient outcome data that may indicate our training in these skill sets had an impact on patient care. Overall, residents, faculty and program directors reported they found this experience useful in expanding their communication skills.

This institutional curriculum is unique in blending national quality and safety initiatives into resident training in Interpersonal and Communication Skills in a manner which provides residents with didactic and foundational knowledge in these six topic areas as well as assesses their ability to demonstrate specific communication skills. The faculty de-brief portion of this curriculum encourages residents' to self reflect on their performance and to identify opportunities for improvement in their communication skills. The partnership that develops between HFHS Department of Medical Education and Department of Quality and Safety strengthens the institution's ability to diffuse our safety initiatives to residents. In a broader context, this curriculum highlights the need to consider communication skills training in these six topic areas as an important part of quality and safety training. ∎

[1]Hann C, Edwards F, Poole B, Godley M, Genuardi F, Zenni E. A Model to Use Clinical Outcomes in Medical Education. *Acad Med,* 2008; 83(6):574–580.

[2]The Joint Commission. *Health Care at the Crossroads: Strategies for Improving the Medical Liability System and Preventing Patient Injury-Executive Summary* Accessed 11/08/08 at http://www.jointcommission.org/NR/rdonlyres/3F1B626C-CB65-468B-A871-488D1DA66B06/0/medical_liability_exec_summary.pdf.

[3]United States Department of Health and Human Services. *30 Safe Practices for Better Health Care.* Accessed 11/08/08 at http://www.ahrq.gov/qual/30safe.htm.

Undergraduate Medical Education Incorporates ACGME's Core Competencies: University of Rochester's School of Medicine Domains of Excellence

Diane M. Hartmann, MD

Since the introduction of the ACGME's Outcome Project in 2002, there has been progressive incorporation of the six core competencies (patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism and systems-based practice) across graduate medical education. Cognizant of its role as a stakeholder in graduate medical education and of the view that medical education is a continuum across one's professional life, the American Board of Medical Specialties (ABMS) has also endorsed the practice of evaluating the six general competencies during initial board certification and reassessing them at regular intervals as part of their Maintenance of Certification (MOC) process. The core competencies have not been applied, however, in a systematic fashion to medical student education across the four year curriculum.

The University of Rochester Medical School curriculum has at its core, the biopsychosocial model of medical practice developed by its faculty members during the 1970s. In the mid 1990s the curriculum evolved into a "double helix" model which intertwined basic science and clinical medicine throughout all four years of education. The goal of the Double Helix Curriculum was for students to learn both in medical school and throughout their professional careers, how to weave together cutting-edge evidence-based medical science and the relationship-centered art of clinical medical practice. As part of the school's recent Liaison Committee for Medical Education (LCME) self-study process, members of the Curriculum Steering Committee asked two questions:

1. What is the next step in the evolution of our curriculum for medical students that can take best advantage of contemporary thinking in medical education while building upon the tradition of biopsychosocial medicine and the Double Helix model?

2. If GME trainees and faculty are being asked to demonstrate competence in the six ACGME core competency domains, shouldn't this educational process begin in medical school?

Our answer to these two questions resulted in the development of the Domains of Excellence Project. (An informal survey by the Dean indicated that "domains of excellence" was more inspiring than "competence" and resulted in the renaming.) The Domains of Excellence initiative is the school's major

focus for medical student education over the next five years and will complement work that is going on in GME. The project's goal is to lay the foundation for the development of a "competent physician" who possesses more than traditional knowledge and technical skills. He or she will critically analyze the medical literature, confidently practice evidence-based medicine, effectively communicate with patients and members of the health care team in a multi-cultural society, continuously assess the quality of care and provide and understand complex health care systems to improve patient safety and quality.

To teach these more complex skills and highlight their importance, each of the six domains will be incorporated as integral yet distinct elements in the overall Rochester undergraduate medical education experience. In particular, the group desires to explicitly ensure that each domain receives its appropriate attention throughout the four years and across all courses and disciplines in a balanced manner. The work of the curriculum group has been designed to proceed in three phases. First, baseline data is being collected to determine where material regarding each of the six Domains of Excellence is currently present in the curriculum. Second, all course and clerkship directors have been surveyed to indicate where the domains are covered in each of their lectures, problem-based learning sessions, labs, and other small group or whole class exercises across the four years. This has provided a wealth of data that is now being summarized. Third, point people have been assigned to take a closer look at the educational exercises for selected domains starting with systems-based practice, practice-based learning and improvement and professionalism. These individuals will review the actual PowerPoint® presentations, handouts and/or other materials for each and every exercise to get a more nuanced sense of what is being done in each domain. Based on this quantitative and qualitative assessment, the curriculum committee will develop proposals to modify existing and add new innovative exercises to address content or skills that are not being met sufficiently in the current curriculum.

While we have not formally assessed the student's attitudes or knowledge of the domains, recent informal discussions with our fourth-year students indicate that they have "sort of" heard of the ACGME core competencies. Most class members, however, knew little or nothing regarding what they actually were or how they were being used in GME. It is our opinion that if these concepts are introduced in the medical school years, they will become a natural part of each physician's knowledge base and easier to augment at each phase of a physician's future education. Given the fact that most residents are actively engaged in medical student education, it will also be interesting to observe how residents' own experiences with competency-based learning and assessment shapes their teaching when student education is framed in a similar manner. ∎

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Resident Leadership in the Patient Safety Initiative at the University of New Mexico Health Sciences Center

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Introduction

In the past decade, patient safety and quality improvement have steadily gained in importance for academic and community medical centers. Federal institutions, accrediting organizations, and payers have developed safety priorities to catalyze change and improvement in care. However, there has been relatively little engagement by physicians in graduate medical education. This article describes a process to proactively involve residents in quality and safety initiatives, rather than asking them to react to institutional priorities or comply with regulations. We conducted a survey designed to discern the residents' priorities and concerns regarding patient safety and used the results to organize a resident-led retreat. The retreat showed a disparity

> "Among issues most concerning to residents were Emergency Department overcrowding and staff shortages, while concerns usually attributed to resident staff, such as work hours and fatigue, ranked considerably lower on the list."

between the administration's safety initiatives and resident perceptions. Recommendations resulting from the retreat were presented to the appropriate administrative committees for consideration and implementation. Among issues most concerning to residents were Emergency Department overcrowding and staff shortages, while concerns usually attributed to resident staff, such as work hours and fatigue, ranked considerably lower on the list. The article also discusses differences between resident perceptions and the perspectives of national safety leaders and organizations charged with overseeing patient safety. We believe this project may prove a useful model for academic hospitals seeking to incorporate their resident physicians in the quality improvement process.

The publication of the Institute of Medicine's Report *To Err is Human*[1] in 1999 raised the concept of patient safety to national prominence. Facing a variety of institutional expectations and limitations, patient safety initiatives share similar themes. Factors that have been recognized as critically important to the success of a safety program include the need

to identify patient safety concerns early; overcoming budgetary constraints;[2] institutional changes necessary to achieve a "culture of safety,"[3] and securing buy-in with the various departments within a hospital system.[3,4,5,6] Physicians are a targeted group for inclusion, and experts have noted that the medical staff constitutes both a critical and elusive group for securing buy-in for efforts to promote patient safety.[7,8]

At the same time, for the more than 115,000 physicians in training, the research on involvement in patient safety efforts is relatively limited. Education of medical students and residents on patient safety and quality assurance has been sporadic. In a recent survey, only 10% of medical school curriculums included courses on patient safety.[9] However, the importance of safety for this group has been shown in several studies. One study showed a correlation between residents meeting criteria for major depression and an increase in the rate of errors.[10] Residents themselves have published commentaries detailing their concerns about the work environment, including frequency of interruptions, lack of nursing unit continuity, lack of night time attending oversight, and lack of a formalized sign out procedure.[11]

Despite this broad range of concerns expressed by residents, much of the patient safety research in residents has emphasized one issue, sleep deprivation. Although there is significant evidence that fatigue and sleep deprivation have contributed to errors in the clinical setting, there is also evidence that increased hand-offs, as are associated with work hour limitations, are also associated with increased errors.[12,13,14,15] Some evidence shows that work hour limitations create a rushed work force prone to more oversight errors and greater risk of injury or biohazard exposure.[16] At this point, there is limited evidence that shortened work hours have had a positive or negative effect on patient safety.[17,18,19]

The Accreditation Council for Graduate Medical Education (ACGME) has mandated patient safety as an essential content area for all residency training programs.[20] Yet, involvement of residents in a quality improvement process may challenge the traditional view of residents at the bottom of a highly regimented academic hierarchy.[21] A recent survey of quality improvement projects involving residents suggested a mix of "top down" (institution-initiated) and bottom-up (local microsystem-based) approaches to resident involvement.[22] However, there are examples of the creation of "bottom-up" patient safety initiatives among non-physician health care staff. Safety programs have started to include staff surveys and feedback mechanisms and are achieving greater staff buy-in.[23] Repeatedly, employee empowerment, universal engagement, and participatory leadership are themes found in successful patient safety projects.[6,8,24] This project attempted to create a "bottom-up" approach to quality improvement through resident led identification of key safety needs, prioritization of these needs, workshop designed action plans, and continuous follow-up and feedback. In this paper we describe the process and some of the implications of our results.

Methods

This project began as an attempt to involve residents in a measurable patient safety initiative using the Plan-Do-Check-Act, PDCA, model.[25] The PDCA model is used frequently as a tool to create a scientific framework for systems improvement. The model was used as a way to define and organize this project such that it could be continually evaluated and improved as needed. The simple formula for creating improvements, implementing them, and continually reassessing them served as a guide to the development of this patient safety project.

In the planning phase, a web-based survey was designed using Opinio software, and sent to every resident and fellow within the training institution. Survey items were identified using previously published literature, Graduate Medical

> **"After the conclusion of the small group discussions, each group reported salient points from their discussion and formally charged the administration with three goals to undertake within each problem group."**

Education staff input, and informal resident input. An incentive was offered in the form of a $5 gift certificate to a juice bar within the hospital, funded by the office of Graduate Medical Education, without outside financial sponsorship. Residents were asked to rate 23 potential safety concerns on a scale of 1–5, with 1 being "Not a Concern," and 5 being "A Very Significant Concern." Responses were averaged and a ranked problem list was developed from these averages. Respondents were asked to provide comments for each problem.

A full day retreat, the "The 2008 Graduate Medical Education Patient Safety Retreat," was organized based on the top institutional concerns as delineated by the survey results. Residents from each clinical department and various representatives from the hospital administration were invited. The retreat was held at an off-campus site. Administration-led presentations were given in the morning with small group seminars held in the afternoon. The small groups were charged with brainstorming solutions to the problems identified in the survey. Small groups were moderated by residents from the department most intimately involved in each problem. After the conclusion of the small group discussions, each group reported salient points from their discussion and formally charged the administration with three goals to undertake within each problem group. Each recommendation was adopted by one of the hospital's quality improvement committees as a formal mission. The retreat was adjourned with an action plan and agreement to reassess outcomes over a two year period.

Survey of Residents' Concerns about Patient Safety Based on Importance of Issue

Concern (all responses ranked)	Importance (1–5 scale)
1. Emergency department crowding and boarding	3.97 (95%CI 3.71-4.23)
2. Adequacy of patient flow through the institution	3.90 (3.66-4.13)
3. Adequacy of nurse staffing	3.83 (3.59-4.08)
4. Adequacy of technical and ancillary support staffing	3.29 (3.06-3.52)
5. Adequacy of laboratory specimen handling	3.18 (2.92-3.44)
6. Adequacy of social work support	3.11 (2.84-3.39)
7. Adequacy of communication	3.08 (2.86-3.31)
8. Fatigue due to a lack of sleep	3.07 (2.79-3.35)
9. Adequacy of medications for patients upon discharge	3.05 (2.78-3.33)
10. Delays to OR	3.05 (2.78-3.33)
11. Antibiotic timeliness	3.03 (2.78-3.28)
12. Adequacy of access to ambulatory care	3.02 (2.77-3.27)
13. Adequacy of equipment	2.86 (2.63-3.10)
14. Adequacy of patient hand-offs between health care providers	2.75 (2.51-2.99)
15. Medication errors	2.66 (2.45-2.87)
16. Adequacy of response to patient deterioration within the hospital	2.54 (2.32-2.77)
17. Appropriateness of discharge from the hospital	2.46 (2.24-2.68)
18. Availability of life saving equipment in all hospital areas	2.43 (2.20-2.66)
19. Adequacy of faculty attending supervision overnight	2.42 (2.19-2.65)
20. Adequacy of chronic disease management guidelines	2.29 (2.10-2.49)
21. Timeliness of assessment and treatment for acute MI patients	2.20 (1.98-2.42)
22. Adequacy of DVT/PE prophylaxis	2.17 (1.94-2.39)
23. Adequacy of faculty attending supervision during the day	2.00 (1.77-2.23)

Results

A total of 96 responses were received from 500 residents and fellows surveyed, which represented a 20% rate of return. The survey categories and their ranking of importance are shown in *Table 1*. Specific representative comments are noted in *Table 2*. To organize the retreat, the top 14 ranked issues were organized into nine functional categories, chosen for their broad applicability across many hospital departments. Some of the issues such as Ancillary Staffing and Nursing were grouped together as one category, for example "Staffing Shortages." One of the concerns, resident fatigue, was not discussed as it was already an institutional priority being addressed by each department. The retreat had 75 participants, comprised of residents, attending physicians and administrators. By the end of the retreat the participants developed three recommendations for each problem and assigned implementation of the recommendations to existing institutional quality improvement committees. The recommendations are presented in *Table 3*.

Implementation and follow-up

The implementation phase is ongoing. Six months after the patient safety retreat a meeting was held with participation by administrators, committee representatives, and residents to reassess the recommendations resulting from the retreat. Each committee delivered a progress report, received questions and concerns from the residents and other participants, and addressed ongoing efforts and difficulties. Plans were made for repeat reassessments every six months, with ongoing attention paid to resident feedback.

Discussion

Differences between this survey and national safety guidelines were striking. While the national safety guidelines focus on specific outcomes, the survey's focus was on environmental processes and systems issues within the organization. The Joint Commission has identified 11 goals in its publication *2008 JCAHO National Patient Safety Goals*.[26] Highlighted are specific recommendations to reduce medication errors and patient misidentification, and enhance infection control and universal immunizations. The LeapFrog group, on the other hand, ranks hospitals based on measurable qualities such as the use of Computer Physician Order Entry, ICU staffing, and surgical complication rates.[27] The central question that is raised by this project is whether a functioning work environment

"The top three responses were emergency department overcrowding, patient flow, and nurse staffing levels. These were statistically equivalent."

is as important to overall patient well being, as are broadly applied benchmarks. The concept of the four-hour antibiotic delivery for pneumonia is one such example of an industry benchmark, long criticized as limited in scope and harmful to all around efficiency of emergency department flow, which is now coming under question for its overall efficacy.[28] Further

Table 3
Summarized Recommendations from Resident Retreat

Issue	Recommendations
ED overcrowding	1. Robust triage system to "fast track" movement of patients 2. Increased 24 hour capabilities to avoid overnight delays in care 3. Increased emphasis on decompression in times of critical crowding
Staffing shortages	1. Improve communication between medical and nursing teams 2. Establish nursing guidelines for common disease presentations 3. Interdisciplinary training in cooperative medical care
Patient flow	1. Early and effective discharge planning from day of admission 2. Streamlined outpatient follow-up process 3. Standardized systems implemented across all nursing wards
Communication	1. Design standardized hand-off protocols and forms 2. Delineate consultation expectations and format 3. Ongoing interdepartmental communication through chief residents
Timeliness of medications	1. Early systematic identification of time sensitive orders 2. Automatic database of on-call physicians contact information 3. Computerized physician order entry
Access to ambulatory care	1. Standardized appointment scheduling system 2. Expanded facilities, hours, and staffing for clinics 3. Expanded attending-only clinics, to diversify the residents' training
Operating room delays	1. A role for dual circulating nurses 2. Improved communications through call boards and cell phones 3. Productivity incentives for operative suite employees
Handling of laboratory specimens	1. Staff dedicated to maintenance of pneumatic tube system 2. Standardized lab handling procedures 3. Improved communication between pathology and clinical services
Social work and discharge planning	1. System of early identification of social issues 2. Role for non-academic social work inpatient teams 3. Continual monitoring of bed management and hospital needs

research is needed to understand whether patients are benefitted by increased emphasis on specific care goals, such as time to antibiotic delivery, or by a more global emphasis on workplace efficiency and communication.

Of the 500 residents and fellows who received the survey, less than 20% of the house staff responded. This could reflect a bias in the group of residents who responded. One remaining question is whether the residents who responded were representative of the overall group, and whether the ratings and comments would have differed with a larger response rate. A related issue is how to increase residents' participation in surveys that affect their learning and working environment.

With the relatively small response rate, the confidence intervals essentially divide the rankings into two statistically separate groups. The top three responses were emergency department overcrowding, patient flow, and nurse staffing levels. These were statistically equivalent. All other responses were of significantly lower importance. Though the retreat was designed around the top responses from the survey, one

could argue that the retreat should have addressed only staffing levels, patient flow, and crowding. This might have sharpened the focus of the recommendations.

It is unknown whether the recommendations proposed by the resident retreat will have a real and lasting impact on patient safety. Six months after the retreat, the re-evaluation meeting held provided some interesting insights. None of the committees reported that all of the objectives had been achieved. However, all committees reported encouraging progress. It appeared that several of the recommendations generated in the retreat were easy to implement, and had a rapid effect upon patient care, such as the implementation of an automated internet based on-call database. However, many systems issues raised by the retreat were progressing more slowly. Nursing and staffing shortages are nationwide problems, and remain an unresolved issue at this institution.[29] Emergency Department crowding also remains a problem, both nationally

"The need for end-user involvement in the development of quality improvement programs is not a new concept. Application of the concept in the academic medical field, however, has been slow in implementation."

and locally, despite the high priority given to it by the residents. Generally, the tone of the follow up meeting, six months after the retreat, was optimistic and all parties seemed to understand the importance of resident buy-in.

This project represents an approach to patient safety and hospital policy development that takes into consideration more perspectives than the traditional approach. The need for end-user involvement in the development of quality improvement programs is not a new concept. Application of the concept in the academic medical field, however, has been slow in implementation. A hierarchical work environment, a continually shifting and rotating work force, and a lack of adequate time have long been barriers to resident involvement. Yet, residents have the potential to contribute significantly to the quality improvement process. Commonly accepted measures of patient safety and institutional well being are often onerous to employ in the work setting, and do not always independently contribute to better patient care. Instead, the widely recognized value of a "culture of safety" may serve academic institutions well. We have shown that resident participation is possible and is productive. Further evaluation and follow up will be needed to assess whether this process contributes to an improved overall work environment and safe health care setting. ∎

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[1] Kohn LT, Corrigan JM, Donaldson MS, eds. *To Err is Human: Building a Safer Health System*. Institute of Medicine. Washington, D.C. National Academy Press. 2000.

[2] Akins RB, Cole BR. Barriers to Implementation of Patient Safety Systems in Healthcare Institutions. *Journal of Patient Safety,* 2005; 1:9–16.

[3] The National Quality Forum. *The National Quality Forum Updates Endorsement of Safe Practices for Better Healthcare*. (Accessed on www.qualityforum.org June 29 2008).

[4] Agency for Healthcare Research and Quality. *AHRQ's Patient Safety Initiative: Building Foundations, Reducing Risk*. AHRQ Publication No. 04-RG005. December 2003.

[5] Peirce GW. Building the Foundation for a Culture of Safety. *Focus on Patient Safety: A Newsletter from the National Patient Safety Foundation,* 2005; 2:1–3.

[6] Singer SJ, Tucker AL. *Creating a Culture of Safety in Hospitals*. Research in Progress Seminar. August 17, 2005. (Accessed on healthpolicy.stanford.edu 6/25/2008).

[7] Holmboe ES. The Role of Physicians and Certification Boards to Improve Quality. *American Journal of Medical Quality,* 2007; 1:18–25.

[8] Levey S, Vaughn T, Koepke M, Moore D, Lehrman W, Sinha S. Hospital Leadership and Quality Improvement: Rhetoric Versus Reality. *Journal of Patient Safety,* 2007; 1:9–15.

[9] Kane JM, Brannen M. Impact of Patient Safety Mandates on Medical Education in the United States. *Journal of Patient Safety,* 2008; 2:93–7.

[10] Fahrenkopf AM, Sectish TC, Barger LK, Sharek PJ, Lewin D, Chiang VW, Edwards S, Wiedermann BL, Landrigan CP. Rates of medication errors among depressed and burnt out residents. *British Medical Journal,* 2008; 336:488–91.

[11] Volpp KGM, Grande D. Residents' Suggestions for Reducing Errors in Teaching Hospitals. *New England Journal of Medicine,* 2003; 348:851–5.

[12] Lockley SW, Cronin JW, Evans EE, Cade BE, Lee CJ, Landrigan CP, Rothschild JM, Katz JT, Lilly CM, Stone PH, Aeschbach D, Czeisler CA. Effect of Reducing Interns' Weekly Work Hours on Sleep and Attentional Failures. *New England Journal of Medicine,* 2004; 351:1829–37.

[13] Friedman RC, Bigger JT, Kornfeld DS. The Intern and Sleep Loss. *New England Journal of Medicine,* 1971; 285:201–3.

[14] Gaba DM, Howard SK. Fatigue Among Clinicians and the Safety of Patients. *New England Journal of Medicine,* 2002; 347:1249–55.

[15] Petersen LA, Brennan TA, O'Neil AC, Cook EF, Lee TH. Does Housestaff Discontinuity of Care Increase the Risk for Preventable Adverse Events? *Annals of Internal Medicine,* 1994; 121:866–72.

[16] Poulose BK, Ray WA, Arbogast PG, Needleman J, Buerhaus PI, Griffin MR, Abumrad NN, Beauchamp RD, Holzman MD. Resident Work Hour Limits and Patient Safety. *Annals of Surgery,* 2005; 241:847–60.

17 Fletcher KE, Davis SQ, Underwood W, Rajesh SM, McMahon Jr. LF, Saint S. Systematic Review: Effects of Resident Work Hours on Patient Safety. *Annals of Internal Medicine,* 2004; 141:851–7.

18 Volpp KG, Rosen AK, Rosenbaum PR, Romano PS, Even-Shoshan O, Canamucio A, Bellini L, Behringer T, Silber JH. Mortality among patients in VA hospitals in the first 2 years following ACGME resident duty hour reform. *JAMA,* 2007 Sep 5; 298(9):984–92.

19 Volpp KG, Rosen AK, Rosenbaum PR, Romano PS, Even-Shoshan O, Wang Y, Bellini L, Behringer T, Silber JH. Mortality among hospitalized Medicare beneficiaries in the first 2 years following ACGME resident duty hour reform. *JAMA,* 2007 Sep 5; 298(9):975–83.

20 Accreditation Council for Graduate Medical Education. Common Program Requirements. Core competencies. (Accessed at www.acgme.org on 6/26/08).

21 Daugherty SR, Baldwin Jr. DC, Rowley BD. A National Survey of Working Conditions, Learning, Satisfaction, and Mistreatment during Medical Internship. *JAMA,* 1998; 279:1194–9.

22 Philibert I. *Involving Residents in Quality Improvement: Contrasting "Top-Down" and "Bottom-Up" Approaches.* Accreditation Council for Graduate Medical Education. (Accessed at www.acgme.org on 12/1/08).

23 Edwards PJ, Scott T, Richardson P, Espinoza S, Sainfort F, Rask KJ, Jose J. Using Staff Perceptions on Patient Safety as a Tool for Improving Safety Culture in a Pediatric Hospital System. *Journal of Patient Safety,* 2008; 2:113–8.

24 Flin R, Yule S. Leadership for Safety: Industrial Experience. *Quality and Safety in Health Care,* 2004; 13:ii45–ii50.

25 Tague NR. *The Quality Toolbox, Second Edition.* ASQ Quality Press, 2004; 390–2.

26 2008 JCAHO National Patient Safety Goals. (Accessed at www.jointcommission.org 7/12/08).

27 Birkmeyer JD, Dimick JB. *The Leapfrog Group's Patient Safety Practices, 2003: The Potential Benefits of Universal Adoption.* (Accessed at www.leapfroggroup.org on 7/5/08).

28 Wachter M, Flanders SA, Fee C, Pronovost PJ. Public Reporting of Antibiotic Timing in Patients with Pneumonia: Lessons from a Flawed Performance Measure. *Annals of Internal Medicine,* 2008; 149:29–32.

29 Nursing Shortage Fact Sheet. American Association of Colleges of Nursing. Media Relations Department. (Accessed at www.aacn.nche.edu on 8/15/08).

ACGME Accreditation: Practical Advice for One-Year Fellowship Programs

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The ACGME accredits a sizable number of one-year fellowships that provide a focused clinical subspecialty experience for advanced learners. These programs generally are small, educating one to four fellows, and much of the learning occurs through direct contact with faculty. Their small size and clinical focus make written curricula and didactic group learning experiences relatively less important, and these programs also need and possess less administrative infrastructure than larger programs. One-year fellowships in some specialties such as orthopaedic surgery, dermatology and pathology operate as the only accredited program at their institution, without a separate, formal institutional review to demonstrate how the sponsoring institution meets the ACGME's institutional monitoring and oversight functions.

Challenges in the accreditation process for small fellowship programs

Because of this reduced infrastructure for resident education, program directors and coordinators/administrators of one-year fellowships may find it more challenging to prepare for Residency Review Committee (RRC) site visits and reviews. Recognizing this difficulty, in February 2008 the ACGME developed abbreviated requirements for one-year fellowship programs that address their smaller size and reduced need for and capacity to provide administrative infrastructure. The new requirements are being added to the program requirements as each one-year subspecialty undergoes its periodic review and revision of program requirements that occurs at least every five years. To date, they are in effect for Spinal Cord Injury Medicine and Pediatric Rehabilitation (Physical Medicine and Rehabilitation), Surgical Critical Care (Surgery) and Pediatric Transplant Hepatology (Pediatrics), and will become effective for Pediatric Urology (Urology) on July 1, 2009.

Enhancing understanding of the site visit and accreditation process

The ACGME accreditation is based on a program's meeting established educational and support requirements, determined by the Review Committee. The revised program requirements for one-year subspecialty programs are responsive to small programs limited infrastructure, and emphasize key areas deemed important to a high-functioning fellowship program that promotes high-quality education, safe and effective patient care and learner well-being. Key elements of these requirements include:

1. an educational curriculum (clinical experiences, didactics and self-learning);

2. an appropriate educational environment (including the fellow's contract, facilities and the fellows' ability to raise issues without fear of intimidation or retribution);

3. a meaningful evaluation process, including evaluation of the fellows and the faculty, and evaluation of the program, with the goal of continuous improvement; and

4. support by the relevant department and sponsoring institution.

Another aspect of the accreditation process that makes preparing for the site visit and periodic review less transparent for small programs less transparent is the lack of organized program director support groups for some small specialties, particularly for specialties with few programs or those that have recently gained accreditation status. In addition, the needs of these programs often are not addressed by a support network that exists at the level of the core specialty. This void can make it more challenging for new program directors to become fully knowledgeable about the expectations of the accreditation process. Aspects of the ACGME's process that may not be transparent to leaders of these small programs include the fact that ACGME accredits solely residency and fellowship education program, and is a different entity than the accreditors of hospitals, rehabilitation facilities, laboratories or other aspects of the patient care process. The decisions of its Review Committees are made on the basis of the program information form (PIF) and site visit report (SVR). The PIF is a program-reported picture of the fellowship as it exists on the day of the site visit. The site visit report is an objective report that verifies and clarifies the information in the PIF. The site visitor is a reporter, who functions as "the eyes and ears of the RRC," not as a decision-maker in the accreditation process or a consultant to the program. Finally, program directors of small, highly specialized programs may not appreciate that failure to comply with certain aspects of the program requirements is not offset by particular accomplishments or "commendations" in other areas.

One source of information for programs is the sponsoring institution, when these programs operate under a sponsoring institution with full institutional review and oversight. Yet some 700 sponsoring institutions sponsor just one program or a core program and its dependent subspecialty programs accredited by one RRC. These "Single RRC Institutions" may not have an office for graduate medical education to oversee the educational programs, may have fewer experienced individuals who know the intricacies of the accreditation process, and may not have a dedicated, knowledgeable program coordinator or administrator.

Unique challenges for the one-year fellowship

The remainder of this article focuses on elements of the accreditation process that appear to present unique challenges for one-year fellowship programs: 1) meeting the ACGME competency requirements; 2) evaluation of fellows, faculty and the educational program; 3) the internal review process; and 4) clarification of selected expectations for sponsoring institutions that sponsor just one program or a group of programs under the aegis of a single RRC.

Meeting the ACGME competency requirements

One particular challenge in responding to the program requirements for small, highly-focused clinical programs is the development of goals and objectives that are expressed in terms of the ACGME competencies. It helps to remember that one-year programs take advanced learners, with prior exposure to the six general competencies. The goals for the fellowship program should be stated in terms of the additional subspecialty-related clinical, knowledge, communication, professionalism and systems-based practice goals that fellows are expected to meet upon completion of the year. Practice-based learning and improvement goals and systems-based practice goals can be expressed as particular aims, resources, and services to improve the care of the population(s) the subspecialty serves. It is important to make the educational objectives measurable and demonstrative of progress through the fellowship. These advanced, subspecialty-specific objectives will assist in developing a meaningful evaluation program for the fellows.

The program's evaluation processes

Another difficult aspect of the evaluation process for one-year programs is providing a mechanism for confidential evaluations, when the sample of evaluators is one or a small number. Approaches to overcome this challenge can include efforts to de-identifying and aggregating evaluations by "blending" fellows' evaluations with residents rotating on the subspecialty service, aggregating multiple years of evaluations, or arranging for fellows to meet and relate the program evaluation to a neutral third party, such as an institutional administrator or ombudsperson.

An evaluation of the program as a whole needs to incorporate input from the fellows, but can also include input from in-training exams, and graduates' board scores and career placements. While few small programs employ alumni surveys, feedback on graduates' experience in the workplace can offer useful information for small, highly specialized programs, and make the educational program more relevant to graduates' professional aspirations and plans.

Ensuring a functional internal review

All accredited programs, including small, one-year fellowships, are expected to conduct a formal Internal Review that should be completed approximately at the mid-point between the program's last accreditation review and the planned date of the next visit. ACGME has begun to include the approximate target date in the RRC accreditation Notification Letter.

The individuals conducting the Internal Review should be from outside the fellowship and should interview the Program Director, representative faculty members and the fellow(s).

For programs sponsored by institutions with an established Graduate Medical Education Committee, the process is well-established. Programs in Single Residency Institutions find this process more challenging, particularly the need for reviewers who are not part of the fellowship program. Programs sponsored by single-RRC institutions are not required to have

a resident or fellow as part of the review team. Whenever feasible, the perspective of a learner or recent learner as part of the team can be very valuable.

Added considerations for single RRC sponsoring institutions

In place of a full, separate institutional review that occurs for institutions sponsoring programs from multiple RRCs, the review of single RRC institutions occurs in conjunction with the program's site visit. They are expected meet five added requirements to assure the Residency Review Committee that the sponsoring institution provides an appropriate learning environment. The five items are the following: 1) a statement that the institution is committing the necessary financial, educational and human resources to support the program, including endorsement by the governing body; 2) a method for periodic evaluation of the program's educational quality and compliance with the accreditation requirements, including residents'/fellows' involvement in this process; 3) procedures for resident recruitment and selection; 4) documentation of meeting the Institutional Requirements regarding resident support, benefits and conditions of employment; including health, disability and professional liability insurance; and 5) grievance and due process procedures available to residents/fellows.

ACGME resources for one-year fellowships

The ACGME offers a range of resources for one-year fellowships, including information on its web site, educational programs and staff knowledgeable in all aspects of the accreditation process. Resources include:

- an FAQ document about the site visit and related elements (http://www.acgme.org/acWebsite/fieldStaff/fs_faq.asp)
- FAQs for new programs and sponsorship matters (http://www.acgme.org/acWebsite/fieldStaff/fs_faq.pdf)
- FAQs for individual specialties, which are accessible from the RRC's web page, a program director's guide to the common program requirements (http://www.acgme.org/acWebsite/navPages/nav_commonpr.asp)
- a document about the steps involved in applying for accreditation (http://www.acgme.org/acWebsite/home/accreditation_application_process.asp)
- selected notable practices that describe how other programs have addressed selected aspects of the accreditation process

Program directors and others with questions also can call ACGME staff to seek answers to particular questions. The overall aim is to make the accreditation process more transparent and user-friendly for smaller programs with relatively less institutional infrastructure. ∎

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Novel Assessment of Psychiatry Residents: SMS Simulations

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Introduction

Growing concerns about patient safety and about variations in patient care have resulted in strong public opinion questioning both the competence of physicians and the effectiveness of the health care system.[1,2,3,4] Despite increased interest in physician performance on the part of the profession, payers and the public, with the exception of board exam performance as an accepted measure of medical knowledge, the assessment of physician competence has lagged behind.[5] One reason may be the complexity of the tasks, given that assessment of medical competency requires a holistic evaluation that meets individual as well as societal goals. Also, it is imperative that future assessment approaches continue to measure factual knowledge. In addition, they also need to assess the effectiveness and impact of underlying decision-making processes.

It is estimated that 96,806 residents were enrolled in accredited programs (ACGME and combined programs) during 2000–2001.[6] In an effort to establish proscribed areas to be

> **"Across the continuum of medical education, medical students, residents, and practicing physicians are expected to make ever more complex decisions and assume leadership in clinical settings. Unfortunately, our ability to effectively teach and assess these skills in medicine is still relatively primitive."**

addressed in the graduate medical education of all physician residents, regardless of discipline, the ACGME has approved six general Competencies: patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism, and Systems-Based Practice. Assessment of the six general competencies must account for content, process and the assessment's usefulness in feedback and future learning.[7,8,9,10] Most commonly used assessment methods are subjective assessments (faculty ratings), multiple choice questions (factual knowledge) and abstract problem solving.[11] A number of varied new assessment techniques have been developed in recent years. Computer-based instruction, CD-ROM technology, and even virtual reality have been employed in the education and assessment of medical students and residents.[12,13,14,15] Simulated patients have been used both in training[16,17,18,19] and competency testing.[20]

Decision-making and leadership skills are essential to the work of health care professionals. Across the continuum of medical education, medical students, residents, and practicing physicians are expected to make ever more complex decisions and assume leadership in clinical settings. Unfortunately, our ability to effectively teach and assess these skills in medicine is still relatively primitive. This is problematic as we continue the move to competency-based medical education. Particularly, the competencies of Practice-based Learning and Improvement, Systems-based Practice, Interpersonal and Communications Skills, and Professionalism, which are vital to effective physician leadership, perhaps still are not well-understood by residents and, in some cases, the individuals involved in their education.

Clinical decision-making involves much more than medical knowledge. Patient care at the frontlines is a prime example of work under "VUCAD" conditions: volatility, uncertainty, complexity, ambiguity, and delayed feedback. Students and residents learn to make challenging clinical decisions under these adverse conditions at the bedside, often with relatively little opportunity for structured feedback and without a framework for understanding key aspects of decision-making and leadership under such conditions. As they progress through training, they are expected to assume roles which require leadership skills – again with almost entirely "on the job" training and little opportunity to explore the particulars of the skills required and their unique strengths and weaknesses.

Simulation in medical education

Simulation has the distinct advantage of providing "real world" experiences to the learner without causing harm to patients or learners. Simulations can be designed to replicate virtually all complex realities and offer training and retraining using well standardized paradigms. Simulations are increasingly used for training in and evaluation of procedural skills in surgery and anesthesia, for example. We believe that simulation can also be a highly effective way to evaluate decision-making and leadership skills in medicine, providing students and residents with insights into their own abilities and needs, and assisting faculty in reliably assessing competence in these areas.

Cognitive simulations in particular have the intrinsic capability of replicating several aspects of a learner's environment simultaneously. This provides a realistic replication of a healthcare professional's workday which involves several complex demands that have to be processed effectively at the same time. This technology provides a strong compliment to existing simulator technologies which greatly enhance specific procedural skills. Additionally, the Strategic Management Simulations (SMS) described below go beyond simply recreating the learner's complex environment and allowing the learner to practice or be evaluated.

Need for novel assessments

Many medical educators doubt that today's test or evaluation systems provide for a sufficiently reliable assessment of competence. Most certifying boards offer disclaimers which clearly indicate that the provided certificates do not in themselves indicate that the holders of those certificates are competent. This challenges the validity of our current systems of assessment and certification, and ultimately the quality of the educational products of our graduate medical programs. In reality we are able to consistently produce a

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number of very effective and well qualified professionals, but the underlying methodology for producing these individuals relies more on tradition and rote duplication of experiences. There is a need for a finer understanding of the principles by which we produce competency. This then generates a potential for creating a more efficient process of education. We need a system that identifies specific areas for remediation, a system which can eventually provide a metric for improvement. It has been stated that whereas performance is directly measurable, competence is an inferred quality.[21] Creating this process, and measuring its outcomes with success, would be a major improvement for the current system of gestalt-based training.

Challenges of this nature, and measurement of competencies under conditions of ambiguity and uncertainty, are discussed by complexity theory.[22, 23,24,25,26] Writers concerned with instructional technology view the complexity approach as the optimal basis for skill acquisition toward today's requirements.

Method

Twenty psychiatry residents at SUNY Upstate Medical University participated in the SMS simulation. Two standardized tests, the CPPCT (Columbia Psychodynamic Psychotherapy Competency Test) and PRITE (Psychiatry Resident In-Training Exam) were also used to compare performance. In addition, faculty evaluations of residents were collected for two aspects of performance: 1) knowledge of psychiatry, and 2) effectiveness of patient treatment.

Simulation technology

The SMS simulations have been especially effective as assessment and training techniques where professional task requirements are multi-faceted and complex. These simulations were developed to provide multiple competency measurement in tasks and task situations that are potentially complex and volatile and in tasks that may contain ambiguity, some uncertainty, as well as possibly delayed feedback. The

Table 1
Decision-Making Parameters

Basic activity level (BAL)	Overall level of activity (this measure pertains to both relevant goal directed activity as well as distractions and other activity patterns)
Information management (IOR)	Ability to seek and use information efficaciously
Applied activity level (APPAL)	Level of activity that pertains to tasks at hand and overall goal fulfillment
Breadth of approach (BOA)	Ability to think along multiple dimensions and find different solutions to problems
Contextual responses (CRS)	Ability to focus on a task at hand and also concentrate on detailed aspects of specific jobs

measurement system incorporates several subtle, sometimes hard to assess components of functioning, such as communication, team work, utilization of knowledge, integration, use of planning and strategy. The SMS simulations have been used in North America, Europe, Australia and Asia to assess and train decision makers (e.g., government and private industry executives, lawyers, and other professionals). The wide applicability of the SMS technique is based on its generic applicability to multiple settings. Its universal approach to the measurement (and training) of competence in complex task settings has been repeatedly demonstrated. For example, the simulation has provided extensive data (published in more than 300 scientific publications) in the fields of management, psychology, pharmacology, rehabilitation and other disciplines.

> **"Validity studies in various countries have demonstrated that the SMS simulation consistently predicts decision maker success across professional specialties, across cultures and continents (predicting an individual's achievement and future success level on indicators such as 'job level at age', 'income at age', 'promotions' and 'number of persons supervised.'"**

During a simulation, participants make decisions during a ninety-minute task period. The parameters for this are shown in *Table 1*. The absence of requirements to engage in specific actions or to make decisions at specific points in time, the absence of stated demands to respond to specific information, the freedom to develop initiative, and freedom for strategy development and decision implementation allows each participant to utilize his/her own preferred or typical action,

planning and strategic styles. The real-world atmosphere of the task and setting, involving multiple potentially interactive components of task demands as well as multiple and interactive options to engage in various aspects of behavior allows for a more realistic (ecologically relevant) assessment of competency.

Measurement via the simulation technique provides both numeric and graphic (computer generated) information on competence across a range of responses to task demands. Assessed performance attributes on several validated performance indicators vary from "simpler" measures of competency in categories such as "basic activity" through categories such as "contextual activity" and "information management" to increasingly complex measures in such areas of functioning as "applied activity" and "breadth of approach to challenges." The unique aspect of this measurement technology is its ability to define broad parameters of decision-making in specific terms. For example, overall activity level is measured not just in terms of all the activity evident in the simulation but also measured in terms of its specific focus to a particular task and its application to overall goals.

High levels of predictive validity, reliability and applicability of the SMS simulations to real world settings have been repeatedly demonstrated across multiple professions.[27,28,29,30] Validity studies in various countries have demonstrated that the SMS simulation consistently predicts decision-maker success across professional specialties, across cultures and continents (predicting an individual's achievement and future success level on indicators such as "job level at age", "income at age", "promotions" and "number of persons supervised", etc.). Overall validity coefficients consistently exceed $r = + .60$. Reliability values range between $r = + .7$ and $+ .94$.

Standardized test scores

- The CPPCT (Columbia Psychodynamic Psychotherapy Competency Test) is a two and one-half hour paper-and-pencil exam administered under standardized test

Correlations of Variables in the Study

		BAL	CPPCT	PRITE	RATGSCL	IOR	APPAL	BOA	CRS
BAL	Pearson Correlation Sig. (1-tailed) N	1 – 20	.342 .151 20	.236 .242 20	.627* .020 20	.897** .000 20	.817** .001 20	.946** .000 20	.917** .000 20
CPPCT	Pearson Correlation Sig. (1-tailed) N	.342 .151 20	1 – 20	.904** .000 20	.809** .001 20	.504 .057 20	.340** .153 20	.259** .221 20	.324** .166 20
PRITE	Pearson Correlation Sig. (1-tailed) N	.236 .242 20	.904** .000 20	1 – 20	.785** .002 20	.440 .088 20	.086 .401 20	.255** .225 20	.185 .293 20
RATGSCL	Pearson Correlation Sig. (1-tailed) N	.627* .020 20	.809** .001 20	.785** .002 20	1 – 20	.731** .005 20	.539* .044 20	.600** .026 20	.560** .037 20
IOR	Pearson Correlation Sig. (1-tailed) N	.897** .000 20	.504 .057 20	.440 .088 20	.731** .005 20	1 – 20	.761** .003 20	.807** .001 20	.870** .000 20
APPAL	Pearson Correlation Sig. (1-tailed) N	.817** .001 20	.340** .153 20	.086 .401 20	.539* .044 20	.761** .003 20	1 – 20	.638** .017 20	.867** .000 20
BOA	Pearson Correlation Sig. (1-tailed) N	.946** .000 20	.259** .221 20	.255** .225 20	.600* .026 20	.807** .001 20	.638** .017 20	1 – 20	.812** .001 20
CRS	Pearson Correlation Sig. (1-tailed) N	.917** .000 20	.324** .166 20	.185 .293 20	.560* .037 20	.870** .000 20	.867** .000 20	.812** .001 20	1 – 20

*Correlation is significant at the 0.05 level (1-tailed).
**Correlation is significant at the 0.01 level (1-tailed).

conditions. It uses 60 to 70 questions on four to seven case vignettes drawn from clinical practice. Each of the vignettes is followed by several notes on sessions during the course of therapy. Each of these session notes is followed by a series of multiple choice questions concerning how the patient should be understood and the best intervention for the therapist. The CPPCT was initially standardized with 36 psychoanalytic experts and 206 residents during their second through fourth year of training in ten U.S. programs. It has since grown to be used with over 1,350 residents in 72 programs. Raw scores are reported for individuals along with program and national means, standard deviations and respective percentile ranking within training year cohorts.

- The PRITE (Psychiatry Resident In-Training Exam) is a 300 question, multiple choice paper-and-pencil assessment of knowledge in psychiatry across ten content areas. It is taken under standardized test

conditions in two 150-minute sessions. Scores are reported as raw scores which are converted to standardized scores with 500 as the mean score with each standard deviation scaled across 100 points above or below the mean. Individual scores are reported as percentile rankings within the training year cohort in the program as well as nationally. Administered since 1978, it is now utilized to test more than 5,000 residents from over 200 psychiatry residency training programs each year.

Faculty evaluations of residents using a rating scale (RATGSCL)

These evaluations were based on actual performance of residents in their workplace. Attending faculty familiar with the residents' work evaluated each resident on a rating scale. This seven point rating scale (ranging from poor to excellent performance) focuses specifically on resident's performance in terms of patient care and therapy. The scale was designed to assess not just resident knowledge base but also explore the

ability to communicate effectively and make competent decisions. In other words the key elements included both the "knowledge base" and the "effectiveness of performance." Simulation performance on multiple measures was compared with faculty ratings, PRITE and CPPCT.

Results

Scores on the PRITE and the CPPST correlated at r = .904. In other words, the common variance of the two measures exceeds 80% (see *Table 2*). Correlations of the two measures with faculty ratings for knowledge of psychiatry reached .785 and .809, i.e., common variance levels of 60–65%, a value generally considered to be adequate. Correlations of the five simulation measures with faculty ratings focused on "knowledge base" varied from .539 to .627, accounting for about 30–40% of the common variance, values considerably below those

> "Since these measures (based on factor analytic varimax rotation) are independent of each other, it is possible to calculate the joint (unique) contribution to their common variance with faculty ratings of effectiveness of patient treatment at a value of 75% reflecting a correlation coefficient of r = 86.6%. In other words, the common variance of overall simulation performance scores with faculty ratings exceeded the common variance of PRITE and CPPCT with faculty ratings.

generated by the PRITE and the CPPCT. However, the results are quite different when simulation scores are compared with faculty ratings of effectiveness of patient treatment. Correlations of the five (independent) simulation measures are .622 (p < .05, 39% common variance) for applied activity levels; .719 (p < .01, 52% common variance) for basic activity level; .725 (p < .01, 53% common variance) for breadth of approach); .799 (p < .01, 64% common variance) for information orientation, and .818 (p < .01, 67% common variance) for contextual responses. Since these measures (based on factor analytic varimax rotation) are independent of each other, it is possible to calculate the joint (unique) contribution to their common variance with faculty ratings of effectiveness of patient treatment at a value of 75% reflecting a correlation coefficient of r = 86.6%. In other words, the common variance of overall simulation performance scores with faculty ratings exceeded the common variance of PRITE and CPPCT with faculty ratings.

Conclusion

In psychiatry, perhaps more than in other fields of medicine, residents grapple with the essential emotional "VUCAD"[31] of their patients. In psychotherapy, that translates into the residents' competence in terms of the ability to communicate with patients (as well patients' families), ability to look at the patient's problems holistically, success with team interaction and more.

While the PRITE and the CLBT did an excellent job predicting residents' overall knowledge of psychiatry they were less useful (at 60–65% common variance) than simulation scores (86%) when prediction of the quality of patient treatment is considered. Of significance is that simulation data were obtained during a 90-minute simulation task. In distinct contrast, faculty ratings did not stabilize until at least two years after the residents had joined the department. Moreover, simulation performance tends to reflect relatively stable approaches to various complex problems. In other words simulation performance long before resident training is complete should be able to tell us whether or not a resident is likely to develop the patient treatment skills that are reflected in later faculty ratings. Even decisions whether or not to accept an applicant for residency into a program in psychiatry could be aided by measuring (future relevant) competencies that are assessed by the simulation.

Further, these measures help assess the ability to link present and past, identify precipitating events, establish goals, obtain collateral information and ability to establish alliances. These psychotherapeutic skills are significant cornerstones in the learning process of a psychiatry resident.

It should be noted that, in contrast to assessment on the two standard tests, simulation performance values (which are highly stable over time) can be obtained at any time (e.g., even immediately after entry into a residency program) and reflect specific different components of resident competency. Obtained information about the resident's competencies can be used for focused feedback and training to enhance subsequent performance. ∎

[1] Kohn, LT, Corrigan J, Donaldson M. *To Err is Human: Building a Safer Health System*. Washington DC: National Academy Press, 2000.

[2] Meyer G, Lewin D, Eisenberg J. To err is preventable. *Am J Med,* 2000; 110:597–603.

[3] Leach DC. Competence is a habit. *JAMA,* 2002; 287(2):243–4.

[4] Koh GHC, Khoo HE, Wong ML, Koh D. The effects of problem-based learning during medical school on physician competency: a systematic review. *CMAJ,* 2008; 178(1):34–41.

[5] Wanzel KR, Ward M, Reznick RK. Teaching the surgical craft: From selection to certification. *Curr Probl Surg,* 2002; 39(6):573–659.

[6] Brotherton SE, Simon FA, Etzel SI. Graduate medical education. *JAMA,* 2001; 286(9):1056–60.

[7] LaDuca A. Validation of professional licensure examinations: professions theory, test design, and construct validity. *Eval Health Prof,* 1994; 17:178–97.

[8] Ross LP, Clauser BE, Margolis MJ, Orr NA, Klass DJ. An expert judgment approach to setting standards for a standardized patient examination. *Acad Med,* 1996; 71:4S–6S.

9 Reddy S, Vijayakumar S. Evaluating clinical skills of radiation oncology residents: Parts i and ii. *Int J Cancer,* 2000; 90(1):1–12.

10 Wass V, Van der Vleuten C, Shatzer J, Jones R. Assessment of clinical competence. *Lancet,* 2000; 357:945–9.

11 Newble DI. Assessing clinical competence at the undergraduate level. *Med Educ,* 1992 Nov; 26(6):504–11.

12 Mehrabi A, Gluckstein C, Benner A, Hashemi B, Herfath C, Kallinowski F. A new way for surgical education – development and evaluation of a computer-based training module. *Comput Biol Med,* 2000; 30:97–109.

13 Rosser J. CD-ROM multimedia: The step before virtual reality. *Surg Endosc,* 1996; 10:1033–5.

14 Trelease RB. The virtual anatomy practical: a stereoscopic 3d interactive multimedia computer examination program. *Clin Anat,* 1998; 11:89–94

15 Davis DA, Mazmanian PE, Fordis M, Van Harrison R, Thorpe K, Perrier L. Accuracy of physician self assessment compared with observed measures of competence. *JAMA,* 2008; 296:1094–1102.

16 Larbuisson R, Pendeville P, Nyssen AS, Janssens M, Mayn A. Use of anesthesia simulator: initial impression of its use in two Belgian university centers. *Acta Anesthesiol Belg,* 1999; 50:87–93.

17 Rosenberg M. Simulation technology in anesthesiology. *Anesth Prog,* 2000; 47:8–11.

18 Pugh CM, Heinrichs WL, Dev P, Srivastava S, Krummel TM. Use of a mechanical simulator to assess pelvic examination skills. *JAMA,* 1991; 286(9):1021–3.

19 Forrest EC, Taylor MA, Postlethwaite K, Aspinall R. Use of a high-fidelity simulator to develop testing of the technical performance of novice anesthetists. *Br Journ Anaesth,* 2002; 88(3):338–44.

20 Wong AK. Full scale computer simulators in anesthesia training and evaluation: [Des simulateurs informatises grandeur nature pour la formation et l'evaluation en anesthesie]. *Can J Anesth,* 2004; 51(5):455–64.

21 Gonzi A, Hager P, and Athanascu J. *The development of computer-based assessment strategies for the professions,* Canberra: Australian Government Publishing Services, 1993.

22 Kaufmann S. *At home in the universe: The search for the laws of self organization and complexity.* New York: Oxford University Press, 1995.

23 Satish U, Streufert S. The measurement of behavioral complexity. *J Appl Soc Psychol,* 1997; 27(23):2117–21.

24 Streufert S. Complexity and complex decision making: Convergences between differentiation and integration approaches to the prediction of task performance. *J Exp Soc Psychol,* 1970; 6:494–509.

25 Streufert S. Complexity: an integration of theories. *J Appl Soc Psychol,* 1997; 27(23):2068–95.

26 Satish U, Krishnamurthy S. Role of cognitive simulations in healthcare. *Manual of Simulation in Healthcare.* 477–88; Perth, WA., 2008.

27 Streufert S, Pogash R, Piasecki M. Simulation-based assessment of managerial competence: Reliability and validity. *Personnel Psych,* 1988; 41:537–57.

28 Breuer K, Streufert S. Komputergesttzte eignungsdiagnostik mit komplexen dynamischen scenarios. *Zeitschrift fuer Arbeits-und Organisationspsychologie,* 1995; 39:34–6.

29 Satish U, Streufert S. Improving strategic performance on multiple dimensions: An analysis via complexity theory. In *Winning strategies in a deconstructing world.* Strategic Management Society, Berlin, 1999.

30 Satish U, Streufert S. Strategic Management Simulations to Prepare for VUCAD Terrorism. *Journal of Homeland Security,* June 2006.

31 Satish U, Streufert S. Value of a Cognitive Simulation in Medicine: Towards Optimizing Decision Making Performance of Health Care Personnel. *Qual Saf Health Care,* 2002; 11:163–7.

Medicine and Care of the Soul. Caution: Becoming a Doctor May be Hazardous!

F. Daniel Duffy, MD

My medical career began during a time of intense materialistic and individual freedom rooted in methods of scientific evidence. Hard work to acquire expert knowledge and technical skill eclipsed spiritual and moral growth. Of course, we mouthed the principle that our doctoring aimed to prevent suffering and preserve the dignity of life, but we ignored or denied our soul's connection to life's source.

I first met my soul in childhood bedtime stories. They told me how good won over evil, love erased loneliness, and giving brought happiness. These themes echoed in the holy stories of my moral and religious education. Good character arose from faith, hope, and love achieved through prudence, justice, courage, and temperance. My later education used poetry, novels, history and theater to depict more salacious accounts of pleasure and suffering, happiness and despair, creation and annihilation in the human soul's pursuit of enlightenment or paradise lost.

During medical school, I devalued these lessons. I ignored the emotions they stirred. I judged them to be unworthy of study or reflection and superfluous to my professional development. At best, the humanities, particularly philosophy and religion, were entertaining diversions from meaningful work, and at worst an "opiate for the people."

> **"During medical school, I devalued these lessons. I ignored the emotions they stirred. I judged them to be unworthy of study or reflection and superfluous to my professional development. At best, the humanities, particularly philosophy and religion, were entertaining diversions from meaningful work, and at worst an 'opiate for the people.'"**

I learned a different story in my medical education: Random errors interrupt life's orderly processes. Competing life forms disrupt ontogeny causing disease in cells and organs. Sentient creatures feel tissue disruption through activated neuronal networks that move facial and larynx muscles to communicate these feelings as grimaces, moans and symptoms. Trained physicians interview patients about their symptoms, examine them for signs of disease, they analyze the clinical data and synthesize a diagnosis. They negotiate and execute an evidence-based treatment to achieve a cost-effective cure or mitigate continuing symptoms.

I still believe this story and know it in greater detail. I also know that it is only part of the story, and possibly the least important part. I first became aware of the problem with this story when I cried at my medical school graduation. I realized that whenever I heard the word "heart" I would never think first of a valentine. I'd lost something invaluable. Later, I'd learn the loss was not a careless misplacement, but a conscious decision to turn away from connection with soul in pursuit of knowledge and experience with the body and material world. In my one-sided pursuit of understanding human health and disease, I'd lost contact with that which makes us human.

What were the choices leading to this lost contact? During medical school I abandoned prayer and mediation and participation in a faith community. I regularly missed family gatherings and was forgiven family obligations to pursue my "higher calling" to care for the sick. I chose to replace selfless service to others with long duty hours that wore me down, festered resentment, and promoted entitlement.

As my effectiveness as a clinician, teacher and administrator grew, my humanity languished. I became work focused, self-centered, prideful, jealous, angry, resentful, and greedy. I knew what was right, had become completely attached to my ideas and my way. I thought I had an obligation to impose my will on your behavior, whether you were my student, my patient, my colleague, or my family.

Even worse, when I betrayed my own standards of professional practice I'd justify, rationalize and excuse my bad behavior by blaming others or "the system." Self-centered pride had converted knowledge and experience about helping into over-control, false power, and vainglory. The result was misery, despair and emotional isolation. I had lost conscious contact with the spirit of goodness. I'd lost faith, and through my choices any virtuous habits I may have had turned to vices.

The first awareness that something was wrong came during an ACGME meeting for program directors. A young psychiatrist described her recovery from heroin addiction. She had lived the double life of a prostitute supporting her heroin addiction by night and a top ranked medical student and resident by day. She had three hospital admissions for unexplained symptoms, including a seizure. Much later these were discovered to be drug related.

Her story opened my eyes to the hidden problem of addiction within our profession. More importantly it showed me the potential for recovery. She explained the life or death choice that included attention to the soul and development of moral character. I saw the power of denial and the betrayal of good intentions through self-defeating behaviors. I began to reconsider my hardened idea that practices that nurture the soul were worthless.

Some years later, my armor of self-reliance and self-righteousness cracked further during an AACH faculty development course. Through deep conversations with colleagues and interviews with patients my encrusted encased emotions broke through. I can only describe the experience as "falling in love," not to a person but to everyone. I experienced what Anthony Suchman, MD calls "connexion" – that feeling of emotional oneness and peace with others. It is the numinous experience of unity in Love, Truth and Peace.

Following that momentary lapse into selflessness, my soul sickness progressed until I hit a deeper emotional and spiritual bottom – some call it burnout, depression, mid-life crisis or the dark night of the soul. At that point in life I had everything I needed; but I felt empty and unfulfilled. Later I learned that this mood came from my neglected soul. I had turned my back on truth and love and pursued my narrow self-interests. I had lost any humility and gratitude I might have had, and replaced these attitudes with self-righteous pride, entitlement, and disregard for the feelings or welfare of others. My recovery story involves the usual false starts: several confrontations by my boss, one by my family, and one by colleagues. I denied my problem; I was deep in a box. I began reading self-help books, studying pop psychology, taking

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professional courses in humanism, communications and interpersonal skills, joined a men's group, entered therapy, and talked with others who had turned their disturbed lives around.

It was in helping several residents recover from addictions that taught me how to change. One of these residents introduced me to the 12-Step network of self-organizing groups committed to recovery from self-defeating habits through spiritual growth, moral character building, and helping each other. I liked what I saw; I wanted what they had. I saw people whose problems failed to yield to medical care, return to health when they added this approach. After letting go of enough pride and self-sufficiency to listen, I began to work the steps and my soul sickness faded.

So what does the story of my rather ordinary mid-life emotional collapse have to do with medical education? I think a lot.

We might include in our teaching medical professionalism the care of the doctor's soul. We ought to incorporate collective reflection on the actions that make our professional values and commitments concrete experiences. We might incorporate in our professional norms the fact that our spiritual condition determines our capacity for bringing healing to our doctoring and fulfillment in our lives.

We know that the "hidden curriculum" teaches us habits that blame others for our disturbances. These habits self-justify, explain or rationalize our failings. This curriculum teaches doctor-entitlement and how to deny or hide shame and guilt. Our role models teach us that it's OK to relieve soul-ache with over-work, power and control, pursuit of material wealth, and sometimes abuse of alcohol or drugs. Our professional meetings and casual conversations often amplify negative emotions through criticism, judgment, and spreading the awful. This is understandable. After all, our practice focuses on problems or pathology that we blame and try to fix.

Strangely enough we rarely practice social displays of gratitude, appreciation, humility, and awe for the healing miracles that come through our work together. Nor do we often reflect on the object of our work: the healing of fellow humans. Our focus on problems fails to celebrate the transformation our help brings to others. What I have learned from recovery practices is that the stories we tell to each other are the guide posts on a pathway that transforms devastating disease and problems into remarkable health and happiness. Similar practices could be used in medical education and continuing professional development of physicians.

I am not suggesting that we introduce religious practices into our medical education. Instead I am suggesting that we create the need for a safe space to engage in regular collective reflection on the greater purpose of our work. We can create the habit of admitting not only our technical errors, but also our professional transgressions and sharing our experience in how we practice becoming more responsive to the person in everyone we encounter.

Listening to each other's heartfelt case presentations can provide concrete evidence of spiritual and moral growth through resolving our inevitable conflicts between selfish self-interest and selfless self-preservation. We may learn how we each depersonalized others to justify our betraying personal and professional values. We may learn how our actions increase the burdens of others or mistreat them without realizing it. We may learn how our closed minds, cynical hearts, or fearful wills obscure the truth about ourselves and others and interfere with potential solutions.

I believe that professionalism can only be learned by sharing our conflicts and our uncomfortable pathways to better character. Our natural tendency to self-protection can not be overcome by thinking it away. The way to living a life of selfless self-preservation, the core competence needed for medical professionalism, is long, circuitous and requires a community of willing supporters who tread the same path. ∎

RRC/IRC Update

ACGME approves revisions to program requirements for selected specialties and subspecialties

At its September meeting, the ACGME approved major revisions of the Program Requirements for Internal Medicine and the Program Requirements for Urology. The revised requirements for both specialties will become effective July 1, 2009.

The Council also approved the addition of the common requirements for one-year fellowships to the Program Requirements for Spinal Cord Injury Medicine and Pediatric Rehabilitation Medicine as subspecialties of Physical Medicine and Rehabilitation, effective September 16, 2008.

The Committee recommended approval of minor revisions to the Program Requirements for Pediatric Transplant Hepatology (a subspecialty of Pediatrics), and also approved incorporation of the common requirements for one-year fellowships, to become effective November 16, 2008.

The Committee recommended approval of the major revision of the Program Requirements for Pediatric Urology, including the incorporation of the common requirements for one-year fellowships, with both changes effective July 1, 2009.

The Committee on Program Requirements reviewed a summary of the specialty program requirements that use the term "will" (as in "the program will" or "residents will be educated in…") to denote the expected level of compliance. The Committee resolved that where the term "will" appears in the program requirements, it will be replaced with either "must" or "should" at the time of the next major revision of the requirements in the specialty. The two latter terms are well-defined in the ACGME's glossary and understood by program directors, designated institutional officials and other constituents.

ACGME awards 2009 John C. Gienapp and Courage to Teach and Courage to Lead Awards

At the September meeting, the ACGME awarded the John C. Gienapp Award to William H. Hartmann, MD, the outgoing ACGME Chair. Dr. Hartmann is the eighth major contributor to resident education to receive the Gienapp Award, which is awarded at the discretion of the ACGME Board of Directors. Prior recipients have included Jordan Cohen, MD, Alvin LeBlanc, MD, William Williams, MD, Paul Friedman, MD, Ronald Berggren, MD, David Glass, MD and Paul Batalden, MD.

Dr. Hartmann was recognized for devoting his career to graduate medical education, with much of this effort devoted to the ACGME over several decades. He served on the Residency Review Committee for Pathology as a member and its chair, and in 2001 joined the ACGME Board of Directors representing the American Board of Medical Specialties. He served as the ACGME's chair from September 2006 through 2008.

The ACGME also announced the winners of the 2009 Courage to Teach and Courage to Lead Awards. The Courage to Teach Award, named after Parker J. Palmer, PhD, a senior adviser at the Fetzer Institute and the author of *The Courage to Teach: Exploring the Inner Landscape of a Teacher's Life*. The Courage to Teach Award honors program directors for their distinguished service and dedication to resident and fellow

education. The award has been given annually since 2001 to recognize outstanding program directors nominated by faculty and residents, and the number of awardees each year is limited to 10.

The 2009 Parker J. Palmer Courage to Teach Awardees:

- **Michael S. Beeson, MD, MBA, FACEP**
  Emergency Medicine, Summa Health System/ Northeastern Ohio Universities College of Medicine, Akron, OH

- **James K. Burks, MD**
  Internal Medicine, Texas Tech of the Permian Basin, Odessa, TX

- **Peter J. Carek, MD, MS**
  Family Medicine, Trident Medical Center/Medical, University of South Carolina, Charleston, SC

- **Edmund S. Cibas, MD**
  Cytopathology, Brigham & Women's Hospital, Boston, MA

- **Nancy D. Gaba, MD**
  Obstetrics and Gynecology, George Washington University Medical Center, Washington, DC

- **Sheela S. Kapre, MD**
  Internal Medicine, San Joaquin General Hospital, French Camp, CA

- **Gail H. Manos, MD**
  Psychiatry, Naval Medical Center, Portsmouth, Portsmouth, VA

- **Drogo K. Montague, MD**
  Urology, Cleveland Clinic, Cleveland, OH

- **Lori Schuh, MD**
  Neurology, Henry Ford Hospital, Detroit, MI

- **R. James Valentine, MD**
  Surgery, University of Texas Southwestern Medical School, Dallas, TX

- **Richard E. Welling, MD**
  Surgery, Good Samaritan Hospital, Cincinnati, OH

Through its Courage to Lead Award, the ACGME also annually recognizes a small number of designated institutional officials (DIOs) who have demonstrated excellence in overseeing programs through the sponsoring institutions. Designated institutional officials, or DIOs, have authority and responsibility for graduate medical education programs in a teaching hospital, community hospital or other institution that sponsors residency programs. The 2009 Courage to Lead Award Recipients are:

- **Diane Hartmann, MD**
  University of Rochester Medical Center

- **Lois Bready, MD**
  University of Texas Health Science Center, San Antonio

- **Andrew Filak, MD**
  University of Cincinnati College of Medicine

The ACGME congratulates its 2009 Award recipients.

ACGME appoints new directors and says farewell to outgoing leaders

At the September 2008 meeting, the ACGME approved the following new directors:

- **John F. Duval**
  Chief Executive Officer, Medical College of Virginia Hospitals and Clinics, Virginia Commonwealth Health System (AAMC)

- **David Brown, MD**
  Chairman, Anesthesiology Institute Cleveland Clinic (ABMS)

- **Dorothy Lane, MD, MPH**
  Associate Dean, Continuing Medical Education SUNY at Stony Brook (ABMS)

- **David J. Fine**
  President and Chief Executive Officer, St. Luke's Episcopal Health System, Houston (AHA)

- **William J. Walsh, III, MD, MPH**
  Fellow, Division of Pulmonary and Critical Care Medicine, University of Utah (Resident Director)

The ACGME also bid farewell to its outgoing chair, William Hartmann, MD, and to the outgoing members of the Board of Directors Paul Gardent, Joseph Honet and David Jaffee, and Resident Director Sadeq Quarishi, MD.

In Brief — National and International News of Interest

IOM Consensus Committee Releases Report on Duty Hours for Resident Physicians

On December 2, 2008, the IOM released the report of its Consensus Committee on Resident Hours. The report resulted from twelve months of committee deliberations, with a number of entities within and outside of academic medicine providing their perspective on the effect of work hours and sleep loss on patient safety during several committee hearings and through reports and other documents accepted by the committee. The report made suggestions in three key areas: 1) proposed additional restrictions on resident physicians' hours, with a particular focus on shortening the continuous duty period; 2) recommendations for enhancing enhanced compliance mechanisms; and 3) added recommendations to enhance patient safety in teaching institutions by improving supervision, hand-offs, the process for error detection and reporting, and added education of resident and faculty about sleep loss and fatigue and its effects on performance.

The committee estimated the added funding to hire staff to replace the clinical contribution of residents at $1.7 billion annually. The report established a two-year timeline for implementing the recommendations. ∎

Barriers to Change in the Learning Environment

Results from Group Discussions at the 2007 ACGME Design Conference

Ingrid Philibert, PhD, MBA

"Without question, the most abundant, least expensive, most underutilized and constantly abused resource in the world is human ingenuity. The source of that abuse is mechanistic, Industrial Age, domination concepts of organizations and the management practices they spawn."

Dee Hock

This analysis of team deliberations during an ACGME-sponsored "Design Conference" seeks to shed light on barriers to change in the learning environment. It also offers suggestions for how to overcome them. The context is emerging evidence that the culture of academic medicine appears resistant to change, and a relative dearth of research that has explored the causes of and reasons for this. Despite a substantial business and social science literature on change management, including rich scientific knowledge about barriers and resistance to change across a range of settings, relatively little research has been devoted to study of barriers to change in the learning environment. Medicine and medical education, particularly at the graduate level, continue to be characterized by traditions and processes carried forward over decades. Neither profound change in health care institutions nor the implementation of common duty hour limits by the ACGME in 2003 appear to have had a major impact on many attributes of resident physicians' education.

Barriers to change in the learning environment may be problematic in the context of calls for change to adapt resident education to scientific advances in patient care and educational theory. Other demands for change include the interest in reducing the length and burden of training, and addressing working and learning conditions, such as long hours, some see as serious problem for quality and safety of patient care, and the safety and well-being of residents. At the national level, macro-level barriers to change in resident education that have been identified and discussed include the continued heavy reliance on residents for clinical services in a health care system that is both costly and plagued by resource constraints. The focus of this analysis are medical educators' perceptions of barriers at the institutional and microsystem level that may thwart efforts to innovate in resident education and the settings where residents learn and participate in care, as well as their suggestions for how these barriers could be overcome.

Literature review

A broad body of literature on change in the larger organizational environment spanning more than five decades has identified resistance to change as a reason for the failure of many change initiatives.[1,2] In addition to being identified as a source of costs and delays, researchers have explored resistance to change as a source of information, to contribute to improved, more effective processes.[2,3]

Reasons for resistance at all phases of the planning and implementation of changes include individuals' fear they may be negatively affected;[3,4] disagreement about the sources and causes of problems and appropriate responses;[5] values and loyalty rooted in and concerns about changing the status quo;[3,6] concern about disadvantages in being the first to adopt change;[4] real and perceived gaps in capability;[4] and cynicism.[7]

Research has identified three reasons for lack of a creative response to a given problem, including rapid and complex change in the environment and an inability to do a complete

"At the national level, macro-level barriers to change in resident education that have been identified and discussed include the continued heavy reliance on residents for clinical services in a health care system that is both costly and plagued by resource constraints."

analysis, resignation and the belief that obstacles are inevitable or beyond one's control,[4] and lack of vision on the part of leaders.[2,4] A review of the literature on barriers to change identified distorted perceptions, low motivation and lack of a creative response as barriers during the concept, and cultural, political and communication barriers, capability gaps and cynicism as barriers in the implementation of change.

Method

In September 2007, the ACGME hosted its second design conference. A unique feature of this conference format are design sessions to collect participants' ideas for change and improvement through redesign of the resident learning environment. The theme of the conference was how to manage change in residency education and the learning environment. The event brought together more than 100 program directors, designated institutional officials, faculty, residents and RRC members to discuss how principles from change management could be incorporated into efforts to improve and innovate in the learning environment. Ten groups of 10–12 program directors, designated institutional officials, residents, RRC members and ACGME staff participated in several "design sessions" during an ACGME-sponsored design conference devoted to change management in the learning environment. Participants explored change management in the context of particular innovations in the learning design, such as using quality data to change patient care and resident education, empowering learners as change agents, and making patient safety a prominent attribute of the learning environment. In addition to identifying barriers, participants explored pragmatic

approaches for overcoming barriers, provided suggestions for how ACGME and its review committees could assist programs and institutions in managing change, and discussed how ideas from the community could be leveraged to foster change in the accreditation process.

This analysis focused on results of the group discussions that identified and sought to address barriers to change and innovation in the learning environment. Analysis of the groups' transcripts used grounded theory, an qualitative research approach to allow themes and ideas to arise from open data. To produce the summaries shown in *Table 1* and *Table 2,* the information from the flip charts and notes developed by the design teams was coded using NVivo, a software system that allows social science researchers to analyze qualitative

> "Two barriers at the conceptualization stage — lack of a creative response and deep-rooted traditional values — presented barriers to change in the learning environment, with these factors showing up across different change initiatives considered by the groups, and appearing to have a more significant role than has been suggested in the general literature on resistance to change."

information.[8] The underlying approach is grounded theory, an inductive approach to interpret qualitative data in an iterative approach that looks for concepts and themes in the data.[9] Coding with NVivo identified 22 distinct barriers to change in the learning environment, which were further reduced to the 10 more aggregated concepts shown in *Table 1.* Coding also produced 10 themes for overcoming resistance to change in the learning environment, shown in *Table 2.* To explore the results, the themes were compared to the business and social science literature on barriers to change.

An added focus of the analysis was whether barriers and resistance reported in these settings were comparable to those reported in the general literature on barriers to change and innovation, or whether the presence of different or additional factors could account for the greater resistance to change in the settings where residents are educated, and whether particular recommendations made by design team participants offered ways to overcome these barriers.

Results

The coded results from the group sessions, shown in *Table 1,* suggest that barriers appear present during both the conceptualization and the implementation phase of change. Themes aggregated from participants' comment showed

that resistance to change poses a powerful barrier in the conceptualization stage, potentially resulting in a smaller number of efforts making it to the implementation stage.

An important finding is that lack of a creative response was identified as one of the most critical initial barriers to change. One reason for this could be a lack of well-developed models, particularly models that would allow for more effective integration of resident education into the learning environment, overcoming coverage needs, throughput concerns and financial and other environmental constraints. Another factor in the lack of a creative response is rapid change in the patient care and regulatory environment, with programs and institutions and the ACGME forced to react to changes instituted or proposed by external factors or entities, often without the time to make a comprehensive assessment and to develop a well-thought out plan.

Much of the results are comparable to analyses of resistance to change in studies of industry and other settings. However, two barriers at the conceptualization stage – lack of a creative response and deep-rooted traditional values – presented barriers to change in the learning environment, with these factors showing up across different change initiatives considered by the groups, and appearing to have a more significant role than has been suggested in the general literature on resistance to change.

In addition, the results suggest that cultural and political barriers, such as cultural differences, tradition, deep-seated values and beliefs present a challenge both during the concept and the implementation stage. Strong culture among faculty, residents and administration that rewards conforming also reduces the willingness of individuals to deviate from established norms and suggest ways to do things differently. Other studies of resistance to change have found that strong culture and tradition appears to present less of a challenge to evolutionary changes than to major revolutionary change that result in upheaval in functions, roles and cultural norms.[10]

Finally, the themes emerging from the group discussions suggest that during the conceptualization phase, individuals make references to the barriers that will be experienced at the implementation change. Discussion of barriers to be encountered in a future implementation stage focuses on a range of information and capability gaps, including lack of collaboration and collective actions among departments (or accrediting bodies at the national level), lack of time and financial support for faculty development, and a dearth of valid data and accepted measures to demonstrate the success and failure of a change initiative. All of these are legitimate barriers to implementing a change, yet their discussion at the early conceptualization stage often discourages further consideration of a change initiative. The message is "this will never work, let's not try it."

Table 1

Barriers to Change and Innovation Identified by Stakeholders

			Programs and Institutions	ACGME
Barriers in the Conceptualization Stage	**Lack of a Creative Response**	Implicit Assumptions and Misperceptions ("Vague Strategic Vision")	• Lack of clarity about the meaning and practical implications of new models of care and education, such as "team-based care"	• Accreditation process historically associated with blame • Compliance as a one time "act" (not used for continuous improvement)
		Complex Environmental Changes	• Multiple priorities, demands on institutions	• External demands on accreditation from public, legislators, regulators
		Inertia, Resignation	• Sense of lack of control over the larger clinical environment • Wedded to tradition • Recalling past failures "We tried this before."	• Perceived lack of control over accreditation of patient care quality
		Inability to Test New Approaches	• Lack of variety of program and institutional pilot • Little sharing and publication of results	• Need to demonstrate utility before mandating a new requirement (lack of opportunity for pilots)
		Environmental/ Professional Barriers	• Disciplinary silos affect attitudes, values • Lack of a well-developed mechanism for cross-department, cross-discipline initiatives	• Different accreditation requirements across specialties, health professions disciplines
	Political and Cultural Barriers	Institutional and Professional Silos	• Multiple disciplines increase complexity (culture, educational background) • Different interests among groups • Fragmentation of healthcare: site- or disease-specific	• Accreditation has always been narrow and minimum standards based
Barriers in the Implementation Stage		Discrepancies between Change Values and Professional Values	• Medicine is a hierarchy • "People just pay lip service to team-based care"	• Different accreditation requirements across specialties, health professions disciplines
	Individual Barriers	Low Motivation, Lack of Trust, Cynicism	• Faculty burnout: "Consumed by current responsibilities" • How much buy-in can be obtained without incentives? • Lack of incentives (and risks) for residents to suggest changes to their environment • Uncertainty about effectiveness ("scientific proof")	• Minimum-standards based accreditation has been able to facilitate improvement • More requirements that divert attention and resources away from making a meaningful difference
	Capability Gaps	Data and Information Gaps	• Lack of metrics for team-based skills • Skepticism about data reliability, validity data not accessible in real time, not micro-system or team-based	• Lack of outcomes for several competencies • Lack of information about effectiveness of accreditation approach in enhancing graduates' competence
		Education, Preparation and Competency Gaps	• Faculty educational needs for teaching, assessment, competencies, CQI • Administrators not informed about educational programs; residents do not understand administrative priorities	• Lack of ACGME expertise in individual assessment, psychometrics • RRC members educational needs related to current and new accreditation model

Suggestions for Ways to Overcome Barriers to Change

		Programs and Institutions	ACGME
Barriers in the Conceptualization Stage	**Lack of a Creative Response**	• Create a culture of inquiry about the learning environment • Assess stakeholders' perception of need for change and disseminate findings	
		• Create and communicate a vision and sense of urgency • Form a coalition to guide the change effort • Consider external facilitation for the change process • Promote stakeholder participation and involvement to allow the individuals involved in shaping their future.	
		• Identify, discuss and address the unique barriers of the given environment or system	
		• Reduce resident and faculty frustration through involvement and empowerment and opportunities for leadership	• Collaborate with the profession to build trust and create comfort with presenting and testing innovative approaches
	Political and Cultural Barriers	• Support Systems (infrastructure) to create space for learning and resident and faculty involvement in deeper discussions of the need for change and appropriate responses • Include residents on hospital committees and innovation teams	• Make programs giving evidence of change/improvement in their learning environment part of the accreditation process
Barriers in the Implementation Stage		• Disseminate information on change efforts and highlight successes as well as learning that occurs through failures	
	Individual Barriers	• Select faculty and learners with desirable qualities ("Only Eagle Scouts Need Apply") • Address faculty lack of time and "burnout" through freeing time and credits for involvement • Teach learners (and faculty) to feel safe when suggesting changes that may be perceived as challenging authority	
	Capability Gaps	• Enhance institutional data systems to collect patient care and learning outcomes • Report near misses and errors and use them as learning opportunities	• Report information on failures of change initiatives to promote learning without punishing or devaluing programs involved • Select metrics and markers of success to allow programs and institutions to create a culture of transparency (markers cannot be random and must make sense to stakeholders)
		• Focus on a limited number of important and manageable projects • Create an institutional infrastructure to allow residents to make "small tests of change"	• Enhance capabilities for change and managing change under the existing competency of Practice-Based Learning and Improvement • Adjust accreditation and board certification exams to test for capability for critical thinking vs. memorization
		• Provide cross-discipline opportunities for shadowing (e.g., residents/faculty opportunity to "shadow" hospital management)	• Change focus from "requiring" to "equipping" to enhance capabilities (through an ACGME role in capacity building to overcome gaps)

Overcoming barriers

Participants in the September 2007 conference also suggested approaches to overcome barriers to change. The aggregated themes are presented in *Table 2*. Many of the recommendations mirrored traditional approaches to overcome resistance to change, such as creating the need for change and preparing individuals for the change. A number appeared targeted to address the lack of creative responses and dearth of new models of innovation for adoption or adaptation. Several recommendations suggested a close examination of the fit between organizational priorities and the goals of change and, more generally, education and empowerment as means to overcome the lack of creative responses and the capabilities

> "These barriers to change are overcome, potential benefits within the learning environment could include increased trust in and larger responsibility for residents, which could benefit future practice through their enhanced understanding of physicians' broader role in identifying and addressing opportunities for innovation and improvement. Additional benefits likely include increased satisfaction of residents, faculty, health care teams and patients, and improved patient care and learning outcomes."

gaps once a recommendation for change has been developed and agreed on. At the program and institutional levels selection, empowerment and creating a safe change environment for faculty and learners appear to be important aims.

Key recommendations for the ACGME included work to develop and validate broad, cross-institutional, broadly accepted metrics, and added focus on organizational and individual learning to better prepare individuals, institutions and the accrediting organization to manage change.

Conclusions

Resident and faculty ingenuity, creativity and knowledge about problems in the learning environment could provide ideas for local and national changes to improve the patient care and learning environment, but to date this appears to have occurred only on a limited basis. Little attention has been focused on the specific barriers to change in the learning environment or on ways to overcome them.

This small, informal study showed lack of creative response as a major barrier to change in the learning environment at the level of programs and institutions and for the accrediting organization. One factor may be regulatory and public pressure on the learning environment, creating both the need for change and inadequate time to develop a well-thought-out strategic

response. An added challenge for the accrediting organization is the need to support innovation and change in the learning environment in the absence of having the ability to provide financial support and without this producing a real or perceived threat that the ACGME is trying to regulate creativity.

This paper adds insights on barriers to change in the learning environment. Little prior research has focused on the specific elements producing resistance to change in the graduate medical education setting. The findings suggests that interventions to improve and innovate face added barriers at the conceptualization stage that may make it difficult for ideas to make it to implementation. This is similar to a synergistic culture that has the effect of arresting the development of new models and behaviors. As described by Paul Batalden, elements of this culture include a lack of agreement in the group or community about the common and individual work that is needed to create anything different than the present reality; a desire to focus on centers or "islands" of excellence at the expense of uniformly safe, high quality, reliable and accessible practice and teaching; and a capacity to rationalize away the newsworthiness of data and external assessments, including those of patients, payers and the public.[11]

If these barriers to change are overcome, potential benefits within the learning environment could include increased trust in and larger responsibility for residents, which could benefit future practice through their enhanced understanding of physicians' broader role in identifying and addressing opportunities for innovation and improvement. Additional benefits likely include increased satisfaction of residents, faculty, health care teams and patients, and improved patient care and learning outcomes. ∎

[1] Lawrence PR. How to Deal with Resistance to Change. *Harvard Business Review,* (May/June), 1954; 49–57.

[2] Waddell D, Sohal AS. Resistance: a constructive tool for change management. *Management Decision,* 1998; 36(8):543–8.

[3] Beer M Eisenstat RA. Developing an organization capable of implementing strategy and learning. *Human Relations,* 1996; 49(5):597–617.

[4] Rumelt RP. *Inertia and transformation", in Montgomery, C.A., Resource-Based and Evolutionary Theories of the Firm.* Massachusetts: Kluwer Academic Publishers, 1995; 101–32.

[5] Klein KJ, Sorra JS. The challenge of innovation implementation. *Academy of Management Review,* 1996; 21(4):22–42.

[6] Nemeth CJ. Managing innovation: When less is more. *California Management Review,* 1997; 40(1):59–74.

[7] Bazeley P. *Qualitative Data Analysis with NVivo.* Thousand Oaks: Sage Publications, 2007.

[8] Glaser BG, Strauss AL. *The Discovery of Grounded Theory: Strategies for Qualitative Research.* Chicago: Aldine Publishing Company, 1967.

[9] Reichers AE, Wanous JP, Austin JT. Understanding and managing cynicism about organizational change, *Academy of Management Executive,* 1997; 11(1):48–59.

[10] Val del MP, Fuentes, CM. Resistance to change: a literature review and empirical study, *Management Decision,* 2003; 41(2):148–55.

[11] Batalden, P. Presentation at The Dartmouth Institute "Summercamp", Lake Morey, Vermont, July 2007.

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