November 2004

ACGME **Bulletin**

Accreditation Council for Graduate Medical Education

EDITOR'S INTRODUCTION

The Accreditation Council for Graduate Medical Education publishes the ACGME Bulletin four times a year. The Bulletin is distributed free of charge to more than 12,000 individuals involved in residency education, and is also available on the ACGME's Web site (www.acgme.org) for viewing and printing. The ACGME receives and publishes letters to the editor in the interest of furthering dialogue about accreditation, program quality and matters of general interest in residency education. Inquiries, comments or letters should be addressed to the editor.

Ingrid Philibert
Editor

David C. Leach, MD
Consultant

515 North State Street
Suite 2000
Chicago, Illinois 60610-4322

Phone 312.755.5003
Fax 312.755.5498
Web www.acgme.org

Systems-Based Practice: To Learn About and to Improve the System

This issue of the ACGME Bulletin is devoted to Systems-based Practice, the least well-understood, and possibly most potent, of the six general competencies. At one level, systems-based practice addresses the skills residents need to acquire to navigate their complex and multi-disciplinary environment. At another it seeks to address deficiencies inherent in more traditional approaches to undergraduate medical education, which occurs in stable, highly controlled environments that do not represent the "naturalistic" settings in which decisions are made and medical care is provided. Systems-based practice connects the learner with the realities of the context of medical care. As discussed in the article by Dr. Leach, it has the potential to empower residents to improve the systems of care in which they learn and function. Practical applications of these concepts are provided in the articles by Watson et al. and Quinn, which describe how the principles of systems-based practice can be used to connect residents with their environment and how this facilitates continuous improvement. Mohr and Aneet's article suggests ways for identifying and addressing the "workaround," the way residents get things done in a non-functional system. Rubinfeld et al. describe a web-enhanced version of the traditional morbidity and mortality conference in an academic surgical department.

Simons et al. summarize the ACGME's expectations for Systems-Based Practice, and describe Penn State University's efforts to meaningfully incorporate these concepts into its residency curricula. Several articles in this issue expand information presented at a conference on Systems-based Practice, jointly sponsored by the American Board of Medical Specialties (ABMS) and the ACGME. This conference, held in Chicago in September 2004, is one of a series of at least six conferences the ACGME and ABMS have committed to, in order to promote sharing of best practices and in-depth discussion of each of the six general competencies. The 2005 conference will be devoted to Practice-Based Learning and Improvement.

The interview with Drs. Galbraith and Clyman of the Center of Innovation within the National Board of Medical Examiners suggests that realistic measures of task performance, which can take into consideration the contributing factor of the system, will be a powerful tool for ensuring the public of doctors' competence and for facilitating meaningful assessment and continuous improvement. Finally, the pieces by Mr. Johnson and Dr. Mills reminds us that decisions about graduate medical education occur in a system in which external factors are as relevant as the community's desire to ensure high quality training.

No Resident is an Island

David C. Leach, MD

No man is an island, entire of itself; every man is a piece of the continent, a part of the main.
~from Devotions Upon Emergent Occasions by John Donne (1572-1631)[1]

Systems-based practice is not a new concept; John Donne's quote summarizes it well. Even the title of this 17th century piece would fit right in with the vocabulary of current complexity theorists. "Emergent occasions" are what human actions and interactions are all about, then and now.

On March 4, 2004 Paul O'Neill, former Secretary of the Treasury, spoke at the ACGME Educational Conference. He said that he knew of no other industry that accepted an average reimbursement of 38% of the amount billed.[2] As it seems, 38% may not be far from an appropriate number. On May 4, 2004 Health Affairs published a Rand study of 7000 patients in 12 communities and reported that only about 50-60% of the time did they get care that is known to be good, based on scientific evidence.[3] Beth McGlynn, the Associate Director of Rand Health, was quoted as saying, "It is somewhat outrageous that we spend $1.4 trillion on health care and get it right only half the time."[4] The October 28, 2004 issue of the New England Journal of Medicine contained two articles and an editorial that describe the link between fatigue and serious medical errors in the ICU of a prestigious Boston hospital. In the best case the error rate was 158 serious medical errors per 1000 patient days, with that rate made worse (193 serious medical errors per 1000 patient days) when interns worked 24 or more continuous hours.[5,6,7] It has been said that every system is perfectly designed to get the results that it get.[8] If so, the health care system in the United States is designed to get it right about half the time, to be reimbursed somewhat less than that, and it is also designed to be dangerous to patients. And yet, within this system, really good people are working harder than ever, with more sophisticated knowledge, skill and technology than they have ever had before. The problem is that when the system is broken we cannot fix it by working harder. We need to redesign the work, and to do so with some urgency. This system provides the context within which we educate our residents.

> "And yet, within this system, really good people are working harder than ever, with more sophisticated knowledge, skill and technology than they have ever had before."

The particular of Donne's meditations quoted above (the 17th) begins,

> *"Perchance he for whom this bell tolls may be so ill, as that he knows not that it tolls for him; and perchance I may think myself so much better than I am, as that they who are about me, and see my state, may have caused it to toll for me, and I know not that."*[1]

The image of Paul O'Neill, Dr. McGlynn, and Drs. Lockley, Landrigan, Czeisler and their colleagues, and others causing the bell to toll for medicine seems to fit. It rings true, so to speak. Denial is no longer tenable, and yet the task is daunting. Who has the knowledge, skill and wisdom to redesign the system? What are the roles of physicians; of other health professionals; or of patients and the public? How are we going to do this? ACGME has its part, a focused but nonetheless crucial part – setting standards for residency education and accrediting 8000 residency programs and 800 sponsoring institutions. One hundred thousand residents learning the skills of redesigning the system could change the world; programs directors, DIOs and faculty are doing very important work.

Systems-based practice is one of the six ACGME/ABMS competencies. It requires that residents "demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value."[9] It includes understanding how their own practices affect others, and knowing how to partner with others to improve health care. It includes elements of both the macro system (such as the issues raised by O'Neill and McGlynn) and the micro system (e.g., an ICU such as the one examined and reported in the NEJM study).

Changing one variable in a complex system one may or may not get the intended effect but almost always gets the unintended. Resident duty hour reform is an example at hand. The ACGME implemented common duty hour standards for residents in all ACGME-accredited programs on July 1, 2003. The number of hours worked is an important variable, but not the only one that affects residents' learning environment. Working fewer hours may reduce fatigue, but the numbers of patients seen and their acuity also contribute to medical errors, especially with inexperienced first-year residents. It may be inappropriate for a first-year resident to ever care for patients in an intensive care setting without immediately present supervision.

ACGME now surveys residents over the internet; this year we successfully heard from 25,000 residents, 85% of those surveyed. Of these respondents, 3% reported that they worked more than 80 hours per week in the previous four weeks, and 9% reported working more than 30 continuous hours during their most recent rotation. The vast majority reported that they were better rested, had more time at home and were less stressed. However, several reported negative effects of the reforms. "Call is like a vigil," said one resident, "I'm all alone,

taking care of twice as many patients as usual and have lost the camaraderie that I used to have with my fellow residents." Another said, "The faculty are working harder, they no longer have time for me." A third reported, "Both patient care and my education are worse, I am here less, but am working much harder, know my patients less well, and only have time to get things mobilized before I have to go home."

The issue is more complex than just duty hours. Changing duty hours has provoked the system in ways that can inform redesign. Studies such as those reported in the NEJM validate that ACGME is moving in the right direction. They also make clear that continuing efforts to further refine the standards are needed. Hard data are helpful in the refinement process. On November 18, 2004 the Executive Committee of the ACGME will consider a request from the Duty Hours Subcommittee to establish a new standing Committee on Innovation in the Learning Environment. This committee will collect and interpret information on the relationship between duty hours and residents' learning environment and explore ways to reengineer the interface between clinical and educational activities in teaching settings. The proposed committee also will suggest ways that ACGME can collaborate with other organizations to assess the implications of the duty hour standards on the learning environment, and together with the RRC Council of Chairs provide recommendations on refinement of the duty hour standards and other standards that pertain to the learning environment. It will also identify and report best practices and the state of the learning environment and the education community's efforts to improve it.

John Donne's meditation continues, "…any man's death diminishes me, because I am involved in mankind, and therefore never send to know for whom the bell tolls; it tolls for thee."[1] Both medical education and clinical care need to be redesigned. Patients admitted to a hospital tonight may be comforted to know that their doctor is competent; however, it would comfort them even more to know that no matter who is on call they will receive good care because the system is competent. Our work is too important to accept the status quo. Patients, residents and our profession all feel a sense of urgency. We need change now. ■

[1] Donne, John. Devotions upon emergent occasions. In Donne; Poems and Prose. Everyman's library, Alfred Knopf, New York, 225-227, 1995.

[2] O'Neill, Paul. Marvin Dunn Memorial Lecture, Chicago, March 4, 2004.

[3] Kerr E et al. Health affairs. May/June 2004. 23(3): 247-256.

[4] Washington Post. May 5, 2004.

[5] Lockley S et.al. Effect of reducing interns' weekly work hours on sleep and attentional failures. NEJM. 351:18; 1829-1837.

[6] Landrigan CP et al. Effect of reducing interns' work hours on serious medical errors in intensive care units. NEJM. 351:18; 1838-1848.

[7] Drazen JM Awake and informed. NEJM. 351:18; 1884.

[8] A quote variously attributed to Paul Batalden, Don Berwick or Edward Deming. My first contact with it was from Paul Batalden, personal communication, Spring, 1997.

[9] ACGME at www.acgme.org/outcome/comp/comphome.asp, accessed November 9, 2004.

SYMPAL (SYstems-based Medical Practice And Learning): A Pilot Project

Kathleen Watson, MD, Irene Harris, PhD, Carl Patow, MD, James Breitenbucher, MD and Robert Howe, MD

Introduction

Future physicians must be able to understand and energetically engage in management of health care systems in order to secure excellent and safe care for their patients. Most clinicians–faculty and residents–have a rudimentary grasp of the components and processes to effectively improve systems of patient care, including daily advocacy for their individual patients. Yet, they generally have relegated improvements in the system of care to hospital administrators. Now, the ACGME has challenged programs to train residents to develop competency in "Systems-Based Practice" (SBP) and "Practice-based Learning and Improvement" (PBLI).

"Current models of quality improvement (QI) in teaching hospitals rarely take advantage of the observable fact that much of the care is provided by residents, whose daily insights into inefficiencies and potential hazards of systems of patient care are sophisticated, although untrained."

Current models of quality improvement (QI) in teaching hospitals rarely take advantage of the observable fact that much of the care is provided by residents, whose daily insights into inefficiencies and potential hazards of systems of patient care are sophisticated, although untrained.[1] Any experienced program director understands the degree to which residents are aware of and outraged over gaps in the health care delivery systems for their own patients.[2] We are missing an opportunity to more formally educate residents in systems-based practice and practice-based learning and improvement, and to thereby unleash the power of their intelligence, insights, passion and commitment to improve health care.

We designed a program, SYMPAL (SYstems-based Medical Practice And Learning), to teach residents about SBP and PBLI, and at the same time, link residents' insights into patient safety to quality improvement in teaching hospitals. We describe the program and report the preliminary results of a pilot project.

Methods

The University of Minnesota's Graduate Medical Education Committee (GMEC) Outcomes Project Workgroup designed the SYMPAL project. The goals of SYMPAL are to: 1) improve residents' knowledge, attitudes and skills in SBP and PBLI; 2) promote inter-professional collaboration in the area of patient safety; 3) integrate residents' learning experiences into teaching hospitals' quality improvement processes; 4) demonstrate the value that residents bring to a teaching hospital's quality improvement processes; 5) foster collegiality and collaboration between residency education programs and hospital administrators; 6) establish a residency program quality improvement process to meet the requirements of ACGME; and 7) improve patient safety. Members of the workgroup include program directors, residents, hospital administrators, the medical school director of educational research and evaluation and residency education administrators. The SYMPAL project consists of the following components.

"Residents are instructed to identify characteristics of a problem based upon the Institute of Medicine's STEEEP aims (safe, timely, effective, efficient, equitable and patient-centered)."

SYMPAL Residents' Survey Instrument: This is a log and assessment tool for residents to use during work rounds to identify lapses in safety in the care of current patients. It is available in both a paper and Web-based electronic format. Residents are instructed to identify characteristics of a problem based upon the Institute of Medicine's STEEEP aims (safe, timely, effective, efficient, equitable and patient-centered).[3] They then rate the seriousness of the problem on a 1-8 scale (where 1 is critical and 8 is no error), and note the systems of care that were deficient, using a menu of care systems.

SYMPAL website (http://www.sympal.umn.edu/Login.cfm): The website includes a *Pretest*, which assesses residents' knowledge and confidence in application of SBP and PBLI to improve patient safety. There are nine questions about patient safety and the test provides annotated answers with electronic links to references. A web log (blog) is available for comments by all participants. In the residents' section, the residents or medical students record a patient-based problem and suggest steps to prevent the problem in the future. An adjacent space is designated for the hospital administrator's responses and steps towards resolution of the patient safety issue – within 14 days. Teaching physicians and nurses may also add their comments on the case. All participants have received instruction and passed a test on compliance with HIPAA requirements before using SYMPAL. Upon entry of the case by a resident, the website interface sends the information to the hospital's Office of Patient Safety and also to the GME Office in the medical school. The website also provides downloadable teaching materials – suggestions for attending physicians to incorporate teaching about Patient Safety, SBP and PBLI into teaching rounds and a guide to team teaching – for attending physicians and hospital administrators.

SYMPAL Attending Rounds: A hospital administrator is invited to attend the last 20 minutes of teaching rounds twice per month, to hear residents' findings, and provide brief instruction on requirements for reporting concerns about patient safety, the hospital's patient safety processes and effective methods to improve patient safety.

The Outcomes Assessment Workgroup provided oversight during the pilot phase of the project, including review of submitted problems, responses, and analysis of content for compliance with HIPAA regulations. This group also addressed obstacles at the interface between patient care by teaching teams and hospital administration.

The pilot project was conducted with Internal Medicine and Med/Peds residents on an inpatient General Medicine service at our principle teaching hospital. Residents and program directors from all specialties were invited to participate in SYMPAL.

Results

This pilot project identified several problems in health care delivery, created a forum for discussion of patient safety and QI during teaching rounds, led to improvement in health care delivery, and catalyzed collaboration around patient safety and QI between the GME administration and hospital administration. This article presents two examples of problem cases identified by residents, none of which had previously been reported to hospital administrators.

Case 1: An elderly non-English-speaking inpatient was scheduled for a thallium cardiac stress test. The patient's beta-blocker was held the morning of the test. An interpreter was scheduled, but was unavailable for the initial phase of the stress test. The cardiac technician injected the patient intravenously with radio-labeled thallium, but the patient was unable to understand further instructions to breathe deeply and could not complete the test. Within 30 minutes, the patient developed a cardiac arrhythmia, increased dyspnea, hypoxemia and required transfer to a telemetry unit. The hospital administrator found that the interpreter had been mistakenly double-scheduled. The resolution was to revise the scheduling process and oversight within 14 days of this incident and follow up.

Case 2: A 17-year old patient was admitted through the Emergency Department to the Internal Medicine patient care unit for diabetic ketoacidosis. Over the next 16 hours, the patient was transferred two more times – to the medical intensive care unit and then to the Pediatrics patient care unit, where it was later learned, she had previously been admitted and was well known to nurses. The patient's treatment was delayed by the multiple transfers and poor congruence between the health care

team's skills and the patients' needs. The hospital administrator worked with the admissions office to include a record of the patient's previous nurses and patient care unit at the time of readmission.

These patients did not suffer irreversible consequences. Nevertheless, both raised significant concerns for the patients and their providers. Each case illustrates a range of systems problems and opportunities for quality improvement.

Informal feedback from residents, faculty and hospital administrators indicates that they appreciate the inter-professional collaboration and teaching around improving patient care, feel respected for their contributions, and do not find the SYMPAL process to be burdensome. In fact, the cases have generated a rich and useful dialogue between the teaching team and hospital administrators, at the point of patient care delivery and each has led to changes in the health care delivery system. Residents report learning about process and principles of patient safety monitoring and the roles of physicians and other health care colleagues. None of the residents were previously aware of the STEEEP aims of the Institute of Medicine. Hospital administrators have been uniformly enthusiastic about their participation in teaching rounds, find value in the residents' perspectives, and have gained a new understanding of the frustrations residents feel at times when faced with systems-based obstacles to patient care.

"In fact, the cases have generated a rich and useful dialogue between the teaching team and hospital administrators, at the point of patient care delivery and each has led to changes in the health care delivery system."

Discussion

This ongoing pilot project provides a method to integrate SBP and PBLI into daily resident teaching rounds and directly link residents' observations to a hospital's patient safety and quality improvement processes. At the same time residents and administrators have learned from each others' perspectives on the delivery of health care. During this pilot phase alone, SYMPAL has provided a forum and a tool at the interface of graduate medical education and hospital administration to improve patient safety and promote genuine inter-professional collegiality and collaboration among residents, educators and hospital administrators. The most striking outcome of this pilot project is a logarithmic increase in conversations among residents, educators and hospital administrators about patient safety and the potential roles of residents in QI. These discussions have spawned other collaborative projects involving residents and hospital administration in areas such as medication errors, discharge planning and inter-professional communications. The conversations that began over SYMPAL have continued in other formal contexts, such as the hospital's joint practice committee and in the undergraduate and graduate medical curriculum committees.

The SYMPAL project has taught us lessons that may be generalizable to other institutions. We have identified several obstacles to implementation. The biggest challenge has been to synchronize schedules of residents, nurses, pharmacists and hospital administrators. The web-based entry is intended to overcome this barrier, but is not a substitute for the discussions about individual patients during teaching rounds. Secondly, we learned early that some of our recordings were not compliant with HIPAA regulations, necessitating clarification of instructions to all participants. Not all residency programs have participated in SYMPAL, so our experience is limited and skewed towards Internal Medicine patients. Finally, SYMPAL requires considerable administrative and technical support – especially by the GME office. This type of collaboration between GME and hospital administration has been unusual at our institution, and we have struggled with the content and process of oversight. Factors that have influenced success are rapid responses to residents' concerns by the hospital administration, visible commitment and participation of leaders in quality improvement and education and creative support from the GME office.

Our next steps are to expand SYMPAL to our affiliated teaching hospitals and to other residency programs and recruit more inter-professional perspectives from nurses, pharmacists and patients on patient safety issues. We intend to compare pretest results on knowledge and confidence to those of a post-test, and will update the website for content and functionality. We have formed a Peer Review Group of residents, faculty and a hospital administrator, who report to the GMEC and to hospital administration. This group will confidentially review SYMPAL entries from all participating teaching hospitals and programs and identify themes or trends in patient safety across teaching sites. We have also charged this group to recommend changes in residents' curriculum and improvements in the teaching team/patient care model. The Peer Review process protects case-based information from legal "discoverability." Finally, we plan to integrate the lessons learned from individual cases reported on SYMPAL into residency program and individual quality improvement projects and the GME Core Curriculum in SBP and PBLI. ■

Dr. Watson and colleagues are faculty at the University of Minnesota School of Medicine, Minneapolis, MN.

[1] Volpp KGM, Grande D. Residents' suggestions for reducing errors in teaching hospitals. NEJM 2003: 348:851-855.

[2] Weinbart SN, Tess A, Driver,J Aronson MD, Sands K. Creating a quality improvement elective for medical house officers. J Gen Intern Med 2004; 19:861-867.

[3] Crossing the Quality Chasm: A New Health System for the 21st Century, 39-40. Committee on Quality of Health Care in America, Institute of Medicine. (2001). National Academy Press, Washington, D.C.

Break the Cycle: Rooting out the Workaround

Julie J. Mohr, MSPH, PhD and Vineet Arora, MD, MA

Introduction

With the advent of Systems Based Practice as a core competency, there has been confusion about how to define it as well as how to teach it and assess it. We interviewed several residents on what they think systems based practice is, to identify opportunities for teaching systems based practice in our institution. While there was no commonly understood definition, most thought that "knowing how to work the system," as one resident called it, was a key part of systems based practice. One resident referenced a laminated card that was handed down through generation after generation of interns, with annual modifications, to provide the incoming cohort with knowledge on how to accomplish specific common tasks. Upon closer inspection, we realized that these detailed instructions were actually "workarounds" because they offered a way to accomplish the work in spite of the system that was in place.

A workaround, which is a jargon term from computer programming, means a temporary fix used to bypass, mask, or otherwise avoid a bug or badly designed feature in the system. Theoretically, workarounds are intended to offer a quick fix, and are replaced by a solution that addresses the system problems. In practice, people often find themselves living with workarounds for long periods, as evidenced in our example of the interns passing the list of workarounds to the next generation. Workarounds, as a method for navigating system inefficiencies, are present at all levels of training, professional roles and across disciplines. However, for this discussion our focus will be on resident workarounds on the University of Chicago's general internal medicine floors.

"Workarounds, as a method for navigating system inefficiencies, are present at all levels of training, professional roles and across disciplines."

Workarounds are often celebrated as people share the stories of the problem and their quick fix. As they are perpetuated, the workaround becomes part of institutional knowledge, as in the example of the laminated card. One reason for this is that workarounds often result in positive short-term gains. For example, one resident interviewed provided a story of how hard it was to get a CT scan for a patient. She responded by wheeling the patient down herself and standing outside of the scanner until they agreed to do it. Her team rewarded her for getting the CT done which led to a faster diagnosis and faster discharge. "They don't care how you get it done as long as you get it done;" and the end justified the means. However, when a workaround results in a negative outcome, residents find themselves unprotected, as they failed to follow established protocols and procedures. For example, another resident who also transported a patient to CT was asked to administer contrast. She administered it through the central venous catheter instead of through the peripheral intravenous line. In this case, there were two workarounds. The first involved the resident transporting the patient, and the second was the resident administering contrast. While very different in nature, neither of these tasks were routinely performed by residents. Unfortunately for the resident and the patient, the workaround, although intended to achieve a goal of care, resulted in an adverse event due to lack of following routine procedures.

In many of the examples of workarounds that we uncovered at our teaching hospital and from others who have shared similar stories from other institutions, a pernicious cycle is set into motion that perpetuates the workaround. The institution and all the actors in it respond to the unintended outcome of the workaround by increasing the use of the workaround. Because of a lack of systems knowledge – not understanding how actions ultimately affect other parts of the system – individuals act in their own world, unaware of the larger systems issues. Often, even the most experienced persons in the system do not recognize the destructive cycle of the workaround. It is only after a serious breakdown in the system occurs, often through this destructive cycle, that an investigation may reveal the workaround. We present a case study from our institution to illustrate:

An Example of a workaround

Many residents reported that results for labs, particularly STAT labs, were not being returned in an appropriate time frame. A task force, including residents, attending physicians, laboratory technicians, nurses, unit clerks and administrators was convened to identify the causes of the delays. Several useful facts emerged that allowed the group to piece together what was happening. Residents had been ordering STAT labs as a replacement for regularly scheduled labs that were delayed in the system. Routine labs were delayed because the lab was overburdened with running and reporting STAT labs. In addition, many residents were ordering routine labs at specific times that did not correspond with the routine "sweep" (laboratory drawing and processing) times. The lab staff was set up to facilitate a high volume of lab draws during the sweep times, but reserved the non-sweep time to run STAT labs. Because of the high volume of labs that were being ordered STAT or at non-sweep times, the system was overwhelmed to a degree that ordering a "true" STAT lab could result in a greater wait than ordering a routine lab during a sweep time.

How to break the cycle

In addition to the short-term gains that perpetuate workarounds, residents often lack the resources needed to make real changes in the system. They are not sure how to effectively design and test cycles of change; they lack the authority or power to initiate change; and they lack the time to see it through. Part of the solution to break the cycle of the workaround is to ensure that residents, as well as faculty, have the tools to address system issues. Some suggestions for starting to root out and address workarounds at any institution are listed below.

Offer residents an easy avenue to report problems as they occur. Many residents do not feel empowered to report problems as they occur. Still others may recognize the problem but lack awareness of the appropriate "channels," how to report it or to whom to report it. These barriers to identifying problems can be addressed by giving people an easy avenue to report and communicate issues. Feedback should also be considered part of reporting – as a way to let residents know that they have been heard and that the issue will be addressed.

> "In addition to training residents, it is absolutely crucial to train attending physicians, who may not recognize their role in perpetuating workarounds. For example, rewarding a resident "for getting the test done" as in the case of the resident who wheeled her patient to CT scan off-protocol will only encourage and perpetuate this workaround."

Ensure that the appropriate institutional leaders are willing to work with residents to tackle system issues. This is perhaps one of the harder, but most critical, suggestions to implement. Identifying problems and workarounds is only the first part of any solution. It is important that institutional leaders, including program directors and hospital administrators, are receptive and willing to tackle these issues with residents. Although residents are supremely located to detect system failures, they do not have the institutional knowledge and power to implement solutions. It is only by working with the institutional leaders that this can be achieved.

Provide education and feedback on what is being done to fix the problem. To prevent workarounds from continuing even after a problem is recognized, it is important to educate residents about (1) the problem and the workaround that has been identified; (2) the consequences of the workaround; and (3) how the primary problem is being addressed. In the case of the lab ordering example, it was important to educate the residents that the workaround (in this case ordering routine labs STAT) was causing additional delays and havoc on the system. One interesting feature about this example of a workaround was that residents required a good deal of reassurance that the primary problem was being examined in order to stop using their only strategy for the problem, to order their labs STAT. A campaign to educate housestaff regarding sweep times was arranged and facilitated through resident leaders.

Constant monitoring is needed to prevent slipping back into the workaround cycle. Providing constant monitoring to prevent the use of workarounds is especially important in a teaching hospital. For example, in the case of the lab workaround, a resident representative continues to serve on the task force to address this matter, to bring new issues to light and to facilitate the education of incoming residents.

Train opinion leaders at every level to recognize and root out workarounds. It is important to implement training at every level of personnel to recognize and root out workarounds. In the case of residents, it is often helpful to have a resident "champion", as in the case of the lab issue mentioned earlier. In addition to training residents, it is absolutely crucial to train attending physicians, who may not recognize their role in perpetuating workarounds. For example, rewarding a resident "for getting the test done" as in the case of the resident who wheeled her patient to CT scan off-protocol will only encourage and perpetuate this workaround. Attending faculty is in the unique position of recognizing and teaching about systems-based practice, in the context of workarounds. Training opinion leaders in these domains is crucial to recognition and prevention of workarounds.

Conclusions

Systems issues are prevalent in academic inpatient settings. Interns and residents create elaborate workarounds for the most problematic system issues. As faculty, we have multiple opportunities to tease out the system issues and talk about them, once we recognize them. In addition, there is a need for generalizable methods and tools for teaching about the system issues that emerge from the conversations about workarounds. Recognizing the workarounds can be a Pandora's Box – we need to assure that the organization can support the improvement work that is required to address it. Observation of one's own system is an important first step. We have outlined some of the system issues that we have identified in our institution. We hypothesize that similar issues exist at your institutions, awaiting your efforts to root them out. ■

Drs. Mohr and Arora are faculty in the Department of Medicine, University of Chicago, Chicago, Illinois.

Making Assessment Authentic: An Interview with the Leaders of the NBME Center for Innovation

Ingrid Philibert

When you can measure what you are speaking about, and express it in numbers, you know something about it; when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind; it may be the beginning of knowledge, but you have scarcely, in your thoughts, advanced to the stage of science…." *Lord Kelvin*

What is the Center for Innovation, and what led to its formation?

Dr. Stephen Clyman: The Center was formed in 2001 out of the interest of the National Board of Medical Examiners (NBME) and its president, Dr. Donald Melnick, to address the need for assessment that is able to respond to changes in the health care and medical education environment. This is in keeping with the NBME's guiding principle "To protect the health of the public through state of the art assessment of health professionals." The Center was formed to look at trends; interface with individuals and organizations; and select and further explore those trends in medical education and medical care that lend themselves to new forms of assessment and testing.

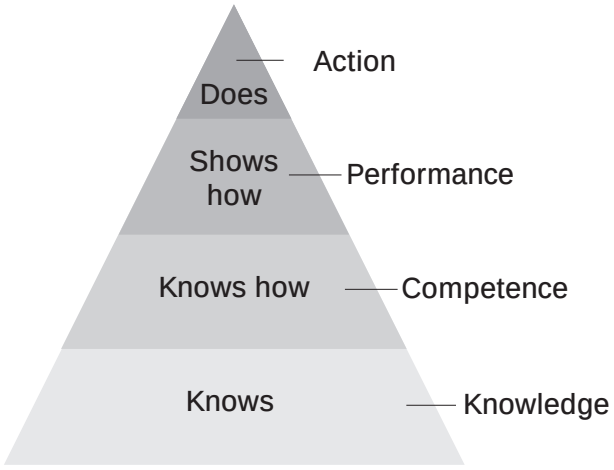
What are the goals of the Center for Innovation?

Dr. Robert Galbraith: There are two goals: developing methods to expand the reach of assessment to new applications, and applying new tests to existing areas. For example, the movement by the ACGME and American Board of Medical Specialties to emphasize the six general competencies has increased interest in assessing them, and in trying out new methodologies. Examples include multi-source feedback, portfolios and other mechanisms that are currently not yet widely used, in part due to concerns about their psychometric properties. There also is increased interest in augmenting high-stakes testing with more formative assessments that are less punitive and inform learners' and practicing physicians' self-improvement efforts.

What are examples of current Center activities and what do you envision five years from now?

Dr. Clyman: The center's "scouting" function is an information-gathering process to identify new areas for assessment. An example that has evolved from scouting into a pilot application is an assessment of professionalism that takes into consideration the contribution of the environment. It offers evidence of the Center's growing interest in honing in on behaviors, rather than knowledge expressed in multiple-choice tests, and in taking into consideration environmental, contextual influences. There is interest in moving higher up on Miller's pyramid (Exhibit 1). This is a general trend in assessment and is not unique to the Center for Innovation.

Exhibit 1
Assessing Competence in Health Professionals
Miller's Pyramid



With thanks to John Norclini, PhD

Drs. Galbraith and Clyman: It is difficult to predict what will happen in five years, but generally our focus is on the assessment of authentic physician performance that takes into consideration the context of the micro-system in which it is nested. This may seem daunting to some members of the traditional testing establishment. But developers of "traditional" tests and the Center share an interest in high reliability, high authenticity and relevance within the actual context of functioning. Their concerns stem from the fact that this will be virtually impossible to realize without initially relinquishing some of the high reliability that currently drive assessment.

Much of the Center's forward vision relates to the goal of providing feedback to learners and practicing physicians that reflects their real experience, but that does not require a major effort on the part of the individual being tested or the system, and that is not viewed as intrusive.

What are similarities and differences in the Center's operation and the remainder of the NBME?

Drs. Galbraith and Clyman: One difference is that the Center seeks "quantum leaps into the wild blue yonder of assessment," while the NBME is looking for continuous, incremental improvement in its existing test and approaches. The National Board is known for its tests, and is concerned with accuracy, reliability and safety. In contrast, the Center uses a more "rough and ready feasibility" concept.

The Center is not responsible for the final development and implementation of tests, which allows it to focus on conceptualization and early exploration of feasibility and utility. Most important, the Center is able to "fail," by which we mean that we can give up on tests that do not realize their early promise. In contrast, the NBME cannot fail; its customers and the public depend on a functioning product that offers reliability and provides a valid score for the candidate.

For the Center, there is a tension between getting too close to the NBME to effectively explore new areas in an unfettered fashion, and moving too far away to be concordant with the NBME's mission and to utilize its resources and expertise to convert promising proposals into functioning tests.

How do you envision the Center's activities will change resident education and medical practice?

Dr. Galbraith: The Center is unlikely to change medical education or practice directly, but we hope to contribute to new assessment and testing in general that could have important effects. One example is how the clinical skills exam is changing undergraduate medical education, by increasing focus on clinical performance and decision-making. It is possible that in the future, increased attention to professionalism will transform medical education, professional development and the practice of the profession.

In the larger world of medicine, assessment still plays a minor role. The focus is on reimbursement issues, and the role of incentives in shaping the behavior of physicians. In the past several years, the shift toward assessment of competencies and maintenance of certification, and a growing link between performance and licensure have increased the importance of assessment. At the same time, the larger role for assessment need not be punitive, but may be more profitably aimed at self-assessment, professional development and continuous improvement.

Dr. Clyman: The growing role of the assessment under the move toward the general competencies can also be seen as a starting point for expanding faculty development and professional development for practicing physicians. It will also shape the conversations that occur within the institutions that promote and shape professionalism.

Are the general competencies of "interest" to the Center for Innovation?

Dr. Galbraith: Certainly. They are. At the same time, our greater interest is in assessments that can take into consideration the real nature and the context of performance. Our conceptual framework recognizes that individuals work in teams, and teams are influenced by the environment in which they are situated. Simultaneously, the Center is looking at data streams that have not been traditionally bent to assessment, particularly data that can be collected unobtrusively and with less cost and effort. Assessing performance within a systems context will make the greatest contribution to the learner, the practitioner and the patient. Here is where the competency "systems-based practice" may be useful as the organizing concept for the development of new assessment tools.

What are significant barriers to high-quality resident education and/or high quality patient care?

Dr. Galbraith and Clyman: One of the most troublesome barriers may be the lack of meaningful, authentic assessment. Well-meaning individuals are doing their best to teach, and well-meaning learners are working hard to learn. Yet, these activities occur largely in a vacuum because little is being measured that could indicate quality. If we were piloting planes, instead of educating physicians, there would be feedback on whether we are reaching our goal. In contrast, in medicine there is a lack of data beyond the anecdotal. That this concerns the Center and the NBME is no surprise. One would expect nothing different from an assessment organization. What may be surprising is that the Center's interest is in adding lower stakes, more formative assessment for the purpose of continuous improvement to our existing high-stakes, summative approach.

"Assessing performance within a systems context will make the greatest contribution to the learner, the practitioner and the patient."

How could the efforts of the Center help overcome these barriers?

Dr. Galbraith: Overcoming these barriers will require assessments that are non-intrusive and provide meaningful feedback to learners and to the professional development of practicing physicians, sensitive to the effects of the system in which assessment is an integral part of learning and performance improvement.

There is a need for data that assess authentic performance within a real-world context. This includes clinical skills testing, high fidelity simulation and related assessments, especially if they can be done in a less intrusive fashion. The overarching goal is to provide information to individual learners and practicing physician that will allow them to take a more active role in their education and continuing development. ■

Robert Galbraith, MD and Stephen Clyman, MD, co-direct the National Board of Medical Examiner's Center for Innovation.

The Center was created to facilitate the NBME's strategic vision by introduction of novel assessment products and services, and the exploration of new market options. Its philosophy is to foster a culture that 1) reinforces NBME values, nurtures professional development and encourages novel approaches to assessment challenges; 2) supports team cooperation as central to optimal problem-solving; and 3) impels scholarly activity that supports idea generation and provides a foundation for innovation.

Systems-Based Practice at Penn State: Putting Theory into Practice

Richard Simons, MD, Beth Garrison, MPA, David Hefner, MPA, Donna Reck, MSN, Michael Weitekamp, MD, MHA

When the ACGME general competencies were introduced several years ago, many program directors were particularly puzzled about two competencies: systems- based practice (SBP) and practice-based learning and improvement. Fortunately, most program directors consulted the ACGME tool box; sought counsel from their specialty program directors' organizations; or borrowed ideas from other residency directors at their own or neighboring institutions to begin the process of incorporating SBP into their programs.

ACGME mandates that the sponsoring institution, through its Graduate Medical Education Committee (GMEC), ensure that each residency program is providing the appropriate educational venues and evaluation systems to address the competencies. But, other than monitoring each program for compliance, what should the role of the institution be in this new era of training? In this article, we describe our institutional approach for systems-based practice.

We believe the current organization and governance of the Penn State College of Medicine and the Medical Center is one of the key factors in our progress with the ACGME Outcome Project. The governance model also exemplifies Penn State College of Medicine/Hershey Medical Center's own "systems" thinking. Governance of the institutions is unified by the fact that the Medical Center's Chief Executive Officer (CEO) of the Hershey Medical Center is also the Senior Vice President for Health Affairs of the Penn State University and Dean of the College of Medicine. The Executive Director (hospital director), the Chief Medical Officer, the Chief Nursing Officer and the Vice Dean for Educational Affairs (who also serves as Chair of the GMEC) report directly to the CEO of the medical center. This organizational structure is important, by linking the interdependent missions of the academic health center. Under the vision and leadership of Darrell Kirch, MD, who serves as the CEO and Dean, a "unified campus team" structure has been put into place to improve input to the institution's decision-making process. In this model, there are three mission teams (academic, clinical and research) and five supporting teams (finance, human resource, information technology, physical space and strategic relations). Each team is composed of 12 to 16 members who meet weekly for two hours to perform the "work" of the team.

The teams tend to deal with more strategic rather than operational issues and work together to set the direction for the institution. Each team has a leader (frequently a department Chair) who is represented on the Teams Council where recommendations from each team are considered and decisions made. In addition to the Team Leaders, the Teams Council also includes the Executive Director, the Chief Medical Officer, the Chief Nursing Officer, the Chief Financial Officer, the Vice Dean for Faculty and Administrative Affairs, the Vice Dean for Educational Affairs, the Vice Dean for Research Affairs. Accordingly, a true team-style for decision-making exists with input from the individuals who comprise the membership. The team structure helps to insure that all missions of the academic medical center are coordinated to achieve success. This "system" of shared decision-making has proven to be effective in creating the appropriate environment to nurture each of the three core missions of our academic medical center.

"The team structure helps to insure that all missions of the academic medical center are coordinated to achieve success. This "system" of shared decision-making has proven to be effective in creating the appropriate environment to nurture each of the three core missions of our academic medical center."

The Vice Dean for Educational Affairs is responsible for providing a "Medical Education Accreditation Update" to the Teams Council on a quarterly basis. This has been a useful forum to share information about the relevance and importance of the ACGME core competencies in residency education with the leadership of the medical center. From the inception of the core competencies, there has been support and alignment for the competencies from the Dean, Executive Director and departmental chairs.

In the early stage of the ACGME Outcome Project, the Graduate Medical Education Office sponsored a series of workshops on the competencies for program directors and key faculty. This was an important first step in educating the faculty about these issues, especially systems-based practice and practice based learning and improvement. To assist program directors with their task of teaching "systems" issues, the Office initiated a monthly "Core Competency Lecture Series" that has been well-received by residents and program directors alike, with average attendance of approximately 350. Topics have been selected with the input from program directors, and have included health insurance, malpractice, medication errors and computerized physician order entry, patient safety, health care economics, health care disparities, regulation of health care in the United States, principles of continuous quality improvement and professionalism. We have found that community experts in various health care-related industries (e.g., health insurance executives, corporate CEO's,

malpractice defense attorneys) are eager for opportunities to present information to our house staff. We also have included several in-house speakers.

Knowing about health care systems is not enough. Residents must be able to use that knowledge to deliver effective, efficient, safe and timely care for their patients. Soon after the new ACGME work hours were introduced, all of our chief residents were invited to a special meeting with the Vice Dean for Educational Affairs to share their concerns about inefficiencies and sources of frustration with our medical center. It was a very lively meeting with many concerns and suggestions offered by our chief residents. Although some major themes emerged (e.g. surgical same day unit, patient evaluation in the emergency room, availability of X-rays for viewing), one concern received more input from our chief residents than any other: our patient transport system. The chief residents voiced their frustrations about the patient transport system – it often affected the residents, because they were expected to transport the patient or the patient transport system led to major delays in patient care. Most worrisome, there were some accounts of patient safety being jeopardized by the patient transport system. This was a true eye-opening experiencing and certainly brought realization to the often quoted statement, *"Residents live in the fault lines of the health care system and give voice to what life is like there."*

Following the meeting with the chief residents, the Vice Dean for Educational Affairs met with the Executive Director, the Chief Medical Officer and the hospital's Chief Nursing Officer to share the concerns expressed by the chief residents. This, in turn, led to a follow-up meeting that included the chief residents with the leaders of the medical center. It was a healthy exchange of information with some real opportunities for improvement realized. Because the patient transport system again emerged as the key issue, a special task force was created to address the patient transport issue that included multiple health care team members including residents and chief residents.

A Patient Transport Redesign Team was formed and charged with reviewing the current design of the patient transport system, identifying the "weak links" in the system, and making recommendations to redesign the way patients are transported throughout the medical center. The resident representatives were helpful in identifying some deficiencies and making suggestions for improvement. They also realized that things were slightly more complex than they had envisioned. Progress reports of the task force were presented at monthly meetings of the Residents Council, which includes representatives from all of the training programs.

By working together toward a common goal; gathering input from residents; and understanding the needs of patients and providers, real improvement and change can occur. To date, the Transport Redesign Team has formed four subgroups to review the process, identify barriers and make recommendations for changes. The subgroups include: transport logistics (ordering tests, scheduling, and communication between departments); equipment (necessary for patient safety during transport); clinical transport (identify clinical issues and criteria surrounding patient transport); and transport efficiency. In addition, several "quick wins" were identified and these changes were implemented immediately to improve the process. They included extending the hours of transport staff availability; an upgrade to the transport scheduling system; and computer terminals in the patient care areas to improve the communications with patient transport.

"In addition, several "quick wins" were identified and these changes were implemented immediately to improve the process. They included extending the hours of transport staff availability; an upgrade to the transport scheduling system; and computer terminals in the patient care areas to improve the communications with patient transport."

Given the positive response and impact of the administration-resident meetings, our Executive Director plans to hold quarterly meetings with the chief residents, Chief Medical Officer, the Chief Nursing Officer and the Vice Dean for Educational Affairs. We believe that residents will gain even greater appreciation for the systems that they interface as they provide care for patients on a daily basis. The new working relationships that have been established between all levels of the organization have proven invaluable to highlight the inter-dependencies of all providers in a complex medical system. We believe that our residents will gain a practical knowledge of SBP. More importantly, we hope the residents will be positive change agents for improving the health care system, which is a key principle underlying the ACGME Outcome Project – to connect good learning with good patient care. ■

The co-authors of this article are faculty of the Penn State College of Medicine/Hershey Medical Center, Hershey, Pennsylvania.

Editor's Note: *Since submitting this article, Dr. Simons reports that Penn State's Core Competency Lecture series continues to draw approximately 350 participants. Further reflection on systems-thinking, precipitated by this article and subsequent conversations, prompted educational leadership to include even more discussion of Penn's local efforts in the conferences series.*

Use of a Web-enabled Morbidity and Mortality Conference to Increase Systems Learning

Ilan S. Rubinfeld, MD, Alexander Shepard, MD, Ann Woodward, MD Atsushi Yoshida, MD

Context

Morbidity and mortality (M&M) conference is a time-honored tradition in surgical education and many consider it the premier teaching conference for residents. The Henry Ford Hospital is a large urban tertiary care referral center. Its surgery department is thriving, yet patient numbers and acuity levels are at all time high levels. This circumstance served to prime us for potential disaster when we were hit with the need to deal with two major ACGME initiatives – resident duty hour limits and the competencies. An already lean environment had the potential to become unstable. An unwritten assumption of surgical education had been that systems problems and quality issues can be handled by increasing resident time and accountability. Many systems conversations in graduate medical education discuss the need for residents to spend great amounts of time and creativity developing the workarounds in their environments to achieve patient care goals in the face of system failures. We had a seemingly endless ability to make residents stay longer to assure that things happened and expectation that creativity and individual tenacity would in the end solve patient care problems. A resident was expected to accomplish these tasks and his/her success was often based on their ability to work long hours and solve system problems creatively.

The traditional method

Our M&M conference was conducted in a manner similar to the way it has been in most surgical departments for many decades. The senior-most resident on each service is responsible for detailing all patient complications and deaths in a list form for each week. He or she submitted a limited data set including: responsible resident, faculty, operation (or reason

Exhibit 1

Henry Ford Department of Surgery Residency Program Morbidity and Mortality Conference: Rules of Conduct

Morbidity and Mortality Conference is the single most important educational session conducted while within a residency training program. Its success depends on the willingness of each and every one of us to bring forth our untoward outcomes, with the expectation that a review of these events among ourselves will promote improvements in patient care.

All M&Ms [events] that have occurred on all services (rotations) during the seven-day interval from Sunday to Saturday are to be listed in the M&M database. This can be done by completing the M&M incident form.

Incidents must be submitted by noon on Wednesday. Failure to submit at this time revokes all operative privileges until submitted. Submissions must be provided by the chief resident of the service directly and not a junior resident.

By 3 pm on Friday, cases are chosen by the Department of Surgery. You will receive an e-mail and an alert on your personal page notifying you. Fill out the M&M Selected Reports Form and Submit it by Tuesday Noon. In the absence of any M&M for the week, we will choose selected cases performed from the previous week for discussion.

1. It is the responsibility of the chief resident of the service that either he/she or a member of the service will present on Friday, regardless whether the attending physician is present or not.
2. No resident below PGY-2 is to present M&M.
3. Every resident is to attend M&M with the only exemption being a surgical emergency.
4. Failure to attend consistently will result in disciplinary measures.
5. All cases should ideally be presented by memory and not read from a sheet. This will discourage presentation of any extraneous information. Notes for labs and studies are appropriate. If an X-ray is pertinent, please have it available.

The key element is to defend one's actions in the OR or in the preoperative management of the cases. Think of it as a court case where you need to defend your actions with data and evidence from the literature. If it is purely a technical error, what would you change or do differently the next time. If you think what you did was not correct, tell us the correct line of action and why.

The presentation of the case is not to exceed 5 minutes. Give pertinent history, operative findings and clinical follow-up.

Excerpted from the Rules of Conduct, M&M Conference, Department of Surgery, Henry Ford Hospital. Detroit, Michigan.

for admission), complication. These lists were then reviewed by a conference co-coordinator and the ones thought to be of highest educational value were selected for formal presentation. The entire list of submissions and cases selected for presentation were placed on a spreadsheet and a one-page summary document created. On the day of M&M, copies of the list were available in the room. Residents presenting cases filled out a detailed case report form for each patient. These forms were usually turned in to the conference coordinator during the conference.

> "We believed that the M&M conference represented an excellent opportunity to utilize electronic tools to improve efficiency, increase educational and systems quality, and enhance safety goals within our residency program and department as a whole..."

Opportunities for improvement

We believed that the M&M conference represented an excellent opportunity to utilize electronic tools to improve efficiency, increase educational and systems quality, and enhance safety goals within our residency program and department as a whole, and established some goals and targets for this:

- We needed to improve speed and efficiency related to paper-based submission processes at all levels.
- We needed a systematic ability to review and organize data.
- We wanted to explore opportunities to incorporate competency based tracking and improvement into the M&M process.
- We wanted to develop systems awareness and systems related outputs from the conference to facilitate institutional change.
- We needed to have a process for collecting and evaluating submitted data from an educational perspective for the resident and a quality and safety perspective for the department.
- We wanted to improve the transparency of reporting data
- We needed to track M&M information back to individual electronic resident portfolios to increase competency based feedback.
- We needed to improve tracking of senior resident administrative performance.

The Web-enabled Method

Pre conference

Rules of conduct are available at all times on the departmental website **(Exhibit 1)**. The conference works on a weekly cycle with fixed and regular intervals where reporting must be accomplished by each surgical service. This accountability is tracked and monitored. The case submittal process is two tiered – a brief report is submitted, and then a lengthier form is utilized when a case is selected for formal presentation. There is a quick and easy method to report a "clean-week", i.e. no reportable cases on the service. There is a one-click option for faculty and residents to view and print the traditional M&M conference summary sheet.

The life of an M&M case:

1. Staff or team members identify a bad outcome, morbidity or mortality.
2. The Senior Resident and/or faculty decide on cases to be submitted for the week
3. The Senior Resident submits brief case report on each patient, or reports a "clean week".
4. The system tracks which teams have submitted on time and sends out appropriate warnings and reminders.
5. The conference coordinator reviews brief case reports, does quick review of cases on electronic health care information system and chooses the cases with the highest educational yield for formal presentation. These cases are then electronically scheduled for conference.
6. Senior residents receive a "Summons" to present cases designated by the coordinator.
7. Resident can request alternative scheduling based on days-off, conference time, or the need to stay compliant with the duty hour limits.
8. Senior residents sign on to the department website and review summons. They then go directly to a specific form where they will enter the following: a brief case summary; a literature review; identification of the competency based issues appropriate to the case; and specific and general systems issues which are organized at the individual, department, and system level.
9. Conference coordinator reviews the full report and can accept or reject with comments.
10. Cases are available for general review on website summary page.

Conference:

The conference is scheduled on a weekly basis and the entire department is expected to attend. The coordinator manages the conference from a front row seat. The chief residents sit together in the front row in the traditional position of honor. There is a laptop computer hooked into the hospital intranet,

and a projector allowing all conference attendees to view the screen. Residents present their cases in turn. During this time, the conference coordinator displays the individual case report on the screen for all to see and can quickly review laboratory, pathology, and radiology data (including PACs images) from the hospital information system. Following the presentation, residents answer questions from the audience and are asked to support their decisions and actions with data from the literature.

Post-conference:

During the discussions during the conference, many of the competencies are addressed. Follow-up actions are frequently based on multiple competencies, with this process individualized and based on the case and ensuing discussion. Action items most commonly derived from the M&M conference relate to systems-based practice. They are handled at the individual, service, departmental, or institutional level. The agent of change may be the individual resident, the residency program, the responsible division, or beyond. Often relevant institutional committees or departmental committees are the recipients of the systems issues highlighted in the M&M conference, and numerous changes can be attributed to this process. Additionally, departmental leaders utilize the outcome and discussion of many of these issues to advocate for our patients and residents with higher-level authorities.

"Often relevant institutional committees or departmental committees are the recipients of the systems issues highlighted in the M&M conference, and numerous changes can be attributed to this process."

Watch-outs and priorities

Electronic solutions are a great aid to the program director, but also present a risk. Naïve, self-serving, or lazy approaches to e-learning and web-based educational endeavors can have a paradoxically diluting and destructive effect on a program. The limitations of the electronic medium are an important concern. We are fortunate to have an outstanding team of web developers with truly insightful abilities and state-of the art technology. We have leveraged that relationship through various successful NASA educational projects. Our award-winning interactive educational software (OPE/ADUM) has resulted in successful remote guidance of highly complex ultrasound images by non-expert astronauts on the International Space Station. Yet, we are humbled by the intensity and richness of the educational and change environment of a well-run morbidity and mortality conference. The jewel, prize, priority, and king of any M&M process remains the conference, with real people in a room engaged in the moment. It is the role of electronic tools to expand the scope, organize the process, improve the efficiency, and, hopefully, increase the educational value of the event.

Future opportunities

Our web-based M&M system remains a work-in-process and represents an important centerpiece for departmental activity, and is capable of expansion into a range of areas:

- To codify outcomes related to systems learning from this conference to allow tracking of actual resulting changes at the various levels.
- To hold institutional leadership at all levels accountable to the findings of our M&M system and encourage their active participation in conference outcomes.
- To spread our web-enabled system to other departments to allow an institutional view of systems issues and assure institutional accountability.
- To create links to quality, utilization, safety, and revenue based databases to assure consistent understanding from various system perspectives.
- To align this system with validated national quality databases, while still acknowledging the complexity of individual services and their own data registries.

Conclusions

Our web-enabled M&M conference has allowed us to reinvigorate our commitment to the M&M process. We have sought to utilize the efficiency of the web and the sanctity of the traditional conference process to improve all educational outcomes, but most specifically systems-based practice. ■

Drs. Rubinfeld, Shepard, Woodward and Yoshida are members of the faculty of the Department of Surgery, at the Henry Ford Hospital, Detroit, Michigan. *This article was expanded from an abstract presented at the ABMS/ACGME Conference on Systems-Based Practice, held September 23-24, 2004 in Rosemont, Illinois.*

Selected Abstracts from the September 2004 ACGME/ABMS Conference on Systems-Based Practice

A Firm-Based Residency Program Enables Residents to Apply System of Care Principles to their Learning Practice

Chakraborti C, Davidoff S, Kendrick D, Pearl R, DeSalv K, Lazarus C, Wiese JG

Purpose

Residents are not prepared to identify and affect changes within a medical practice due to lack of knowledge of systems of care. They are often resistant to learning about systems of care due to a perceived lack of utility of the topic. We hypothesized that restructuring a residency into a firm-based system would enable residents to apply principles of systems of care to their clinical practice, thereby improving the topic's utility and increasing resident competency.

We recognized that the most effective curricula are those that are able to engage learners. One of our primary aims was to minimize the role played by lecture-based didactics. The challenge was in developing a way to present key elements of systems-based practice so that residents actively participated. Our solution was to design the new curriculum to be as task-oriented as possible.

Methods

We utilized a combination of three modalities to engage the residency program in systems of care principles. This included discussion series lead by faculty experienced in systems of care concepts, resident-driven presentations, and participation in a project lasting six months. All one hundred residents of the Tulane internal medicine residency program participated in a systems of care didactic and discussion series covering health systems and practice models, quality improvement methodology, billing and documentation, physician profiling and health care compliance. Faculty members with experience in systems of care concepts lead the didactic series, which began in September of the previous year. During the ambulatory month, Tuesday morning conferences were set aside for this didactic series. Topics repeated every three to four months. With two ambulatory rotations per year, over the course of three years we felt residents would receive adequate exposure to systems of care didactics. One particular component of the didactic sessions was the utilization of the CHESS computer simulation (used with permission, John Voss, MD, University of Virginia) to introduce differences between various health care systems.

Resident-led presentations comprised the second portion of the curriculum. These sessions began in April of the previous academic year and introduced fundamentals of quality improvement. The residents responsible for the quality improvement presentations were designated as project organizers having undergone a one-month long training course.

At the conclusion of the curriculum the residency program was reorganized into a firm system. Each of the four firms operated their own clinic days and one of four ward services at each of the three affiliated hospitals. Faculty mentors were assigned to each firm. Each firm identified a topic important to their ambulatory or inpatient clinical practice. The firms implemented a quality improvement (QI) project using a QI kit, which served as a step-by-step guide and included defined due dates and deliverables.

The resident project organizers developed the QI kit and tracked the progress and deliverables of each of the firms. The QI kit was used to identify and choose a system problem. Flowcharts and stakeholder interviews were used to characterize the system being addressed. The QI kit then facilitated basic root-cause analysis in order to present a solution to the system's power brokers. The last Friday of each month included one half-day of protected time for firm QI project meetings.

Results

Residents particularly valued the didactic and interactive small group meetings. The residency program was successfully reorganized into four firms with ownership and responsibility transferred to firm residents. At five months into the project, all four firms have identified QI projects relevant to their clinical practice. Flowcharts have been created to describe problem systems. Firms are currently interviewing project stakeholders and are utilizing the QI kit to advance their project. Firms are on schedule to present proposed solutions to system problems in meetings with hospital administrators (power brokers) in December of this year.

Conclusions

Restructuring a residency program into a resident-owned, firm-based system in an effective way to actively apply lessons learned from a "systems of care" curriculum. The creation of resident firms further allows the implementation of a new, task-oriented curriculum. ■

The authors are members of the faculty of the Tulane University Health Sciences Center, New Orleans, Louisiana. *The curricular initiative was sponsored by a grant from the Achieving Competency Today (ACT) program, funded by the Robert Wood Johnson Foundation.*

The Health Care Matrix

D. C. Quinn

A Health Care Matrix, developed at the Center for Clinical Improvement, Vanderbilt University Medical Center, and shown in Figure 1, is a response to the challenge of linking the six general competencies with the realities of medical education. It is a framework that accurately projects the complexity of an "episode of care," to explore the linkages between quality health care outcomes – the *Institute of Medicine's (IOM's) Aims for Improvement* – and the skills, knowledge and attitudes – the *ACGME Core Competencies* – necessary to affect those outcomes.

The first row, "Patient Care", is evaluated against the six IOM Aims. If care fails to meet (or in some instances exceeds) these Aims, the learner drills down through the remaining four competencies to analyze deficiencies or to learn why the system worked well. Finally, suboptimal performance is synthesized into the implementation of improvement strategies (practice-based learning and improvement).

Factors that create and reinforce a culture of learning

The intent is to create a new organizational culture by imbedding the Health Care Matrix in the daily work of residents. This new culture acknowledges that residents are learning both *in* and *about* the system of care. The Matrix provides a common framework for evaluating patient care across all disciplines and for all specialties. For example, pediatrics residents are teaming with the nursing staff and managers to improve the residents' continuity clinic. In another example, the Matrix was used to analyze suboptimal procedural outcomes in Nephrology through the use of a morbidity and mortality conference. This helped to identify contributing causes and resulted in plans for improvement. At no time did the program director assign blame; rather, she invited the participation of residents and faculty from other specialties who could contribute to the learning. The emergency medicine residents discovered that many complaints resulted from communication issues, rather than diagnostic skills.

The residency program in Psychiatry uses the Matrix in interdisciplinary case conferences that resulted from a focus on "system-based practice." Internal medicine in their ambulatory rotation use the Matrix to analyze individual problem cases and patients with coronary artery disease included their patient panels. Medical students use the Matrix as part of their neurology rotation using case presentation to the faculty to analyze a patient's care.

Future uses and research agenda

As a means for enhancing personal and professional development

The novice at first may struggle with the Matrix, and take longer to complete each cell. Though a completed Matrix provides a large amount of information, which could be overwhelming, absorbing the information at the individual cell-level can keep the learner from feeling overwhelmed. With multiple uses, learners become more facile with the tool and learn to focus on the cells with the most importance. The completed Matrix leads to a system view of medical education and health care. The act of completing the Matrix itself teaches all six competencies, even when some cells do not apply to the given case. Learners also are invited to address performance improvements since a blank row is revealing in itself.

As a way to document learning

There is a growing need for evidence of effective learning throughout the continuum of medical and other health professionals' education. Use of the Health Care Matrix can document the ability to reflect on an individual learner's outcomes for a patient or panel of patients in terms of the gap between the care provided and the care that could be provided. The Matrix encourages reflection on how this knowledge can be used to improve care. This information can then be compared to evidence from the actual implementation of those strategies and outcomes over time. Faculty evaluations of residents will no longer entail trying to decide if the learner really demonstrated the competencies. Instead, residents will provide faculty with a portfolio based on the Matrix, and the learning/reflections they have completed that relate to patient care. An electronic portfolio is currently in design to accommodate the necessary data (duty hours, procedures, etc.) as well as the Healthcare Matrix.

As an agenda for research to transform patient care

Completed matrices for each specialty will be part of a qualitative research project that will look at the cells, rows, and columns to help decide which "quality characteristics" are important for each specialty. Based on this work, we will be able to demonstrate how data from the Matrices will affect the choice of evaluation tools for residents in each specialty. Collecting and analyzing a series of Matrices provides the foundation for systematic change in patient care and medical education as well as a rich source of data for operational and improvement research. This has already been demonstrated with the ambulatory medicine residents. We will track data over time from various cells of the Matrices in order to create a balanced set of measures to assess progress in patient care and resident education. ■

Doris C. Quinn, PhD, is Assistant Professor, Division of Medical Education and Director Improvement Education, Center for Clinical Improvement, Vanderbilt University Medical Center, Nashville, Tennessee.

Editor's note: *This article presents information from an abstract presented at the ABMS/ACGME Conference on Systems-Based Practice, held September 23-24, 2004 in Rosemont, Illinois.*

A version of this manuscript will be published in Joint Commission Journal on Quality and Safety.

Figure 1

The "Healthcare Matrix" for the Care of Patient(s)

ACGME \ IOM	SAFE(1)	TIMELY(2)	EFFECTIVE(3)	EFFICIENT(4)	EQUITABLE(5)	PATIENT-CENTERED(6)
A. Assessment of Care						
I. PATIENT CARE(7) (Overall Assessment) Yes/No						
II. a MEDICAL KNOWLEDGE(8) (What must I know)						
II. b INTERPERSONAL AND COMMUNICATION SKILLS(9) (What must I say)						
II. c PROFESSIONALISM(10) (How must I act)						
II. d SYSTEM-BASED PRACTICE(11) (On whom do I depend and who depends on me) Improvement						
III. PRACTICE-BASED LEARNING AND IMPROVEMENT(12) (How must I improve)						

(1) Safe: Avoiding injuries to patients from the care that is intended to help them.
(2) Timely: reducing waits and potentially harmful delays for both those who receive and who give care.
(3) Effective: providing services based on scientific knowledge to all how could benefit and refraining from providing services to those not likely to benefit (avoiding underuse and overuse, respectively).
(4) Efficient: avoiding waste, including waste of equipment, supplies, ideas and energy.
(5) Equitable: providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location and socio-economic status.
(6) Patient-Centered: providing care that is respectful of and responsive to individual patient preferences, needs and values and ensuring that patient values guide all clinical decisions.
(7) Patient care that is compassionate, appropriate and effective for the treatment of health problems and the promotion of health.
(8) Medical Knowledge about established and evolving biomedical, clinical and cognate sciences (e.g., epidemiological and social-behavioral) and the application of this knowledge to patient care.
(9) Interpersonal and communication skills that result in effective information exchange and teaming with patients, their families and other health professionals.
(10) Professionalism, as manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles and sensitivity to a diverse patient population.
(11) System-based practice, as manifested by actions that demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value.
(12) Practice-based learning and improvement that involves investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence and improvement in patient care.

Competencies in the Press

Patricia M. Surdyk, PhD, Deirdre C. Lynch, RhD

When the late Marvin R. Dunn, MD, formerly the Director of Residency Review Committee Activities, was asked to explain "Systems-based Practice," (SBP) he reminded us of an important fact: physicians are trained to focus on systems. They develop familiarity and expertise with a variety of organ systems, i.e., the cardiovascular, neurological, or gastrointestinal systems, to name only a few. He would then ask the audience to apply this type of "systems thinking" as a metaphor for the delivery of health care and as the context for developing competency in SBP, namely, "an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value."[1]

At the recent conference on Systems-Based Practice, sponsored in September 2004 by the ABMS and the ACGME (see pages 12 through 17 for articles and selected abstracts from the conference), Paul Miles, MD, outlined what it means for an individual to become competent in SBP.[2] The steps he proposed address three broad aspects of this competency. The first involves the ability to define and describe the systems in which one works. This includes, but is not limited to, the residency program, the specialty department, the hospital, indeed, the entire health care delivery system. It also includes the capacity to identify whether or not the system works well, and how it determines gaps in the quality of service delivery. The second broad aspect of SBP is the ability to identify and analyze potential system improvements, the skill to suggest and prioritize changes to achieve these improvements, and the capability to test their feasibility. The third aspect of SBP involves recognizing interdependencies across systems, from the dependence on correct coding and billing for adequate and accurate reimbursement, to the degree to which comprehensive and effective patient care depends on collaboration among many health care providers, caregivers and external agencies.

"The third aspect of SBP involves recognizing interdependencies across systems, from the dependence on correct coding and billing for adequate and accurate reimbursement, to the degree to which comprehensive and effective patient care depends on collaboration among many health care providers, caregivers and external agencies."

The theme of this installment of "Competencies in the Press" is *integrating SBP teaching activities into resident education.* The articles included demonstrate how creative program directors and faculty have incorporated each of the three broad aspects of SBP identified above into effective educational efforts in their residency programs. Kravet and colleagues use an interdisciplinary conference to focus on relationships across clinical and non-clinical systems, particularly with regard to resource and information management. In their Hospital-to-Home Program, Matter and colleagues describe an approach to improving discharge plans for geriatric patients, thus emphasizing the second aspect of SBP. Using various metaphors, Ziegelstein and Fiebach discuss activities through which they teach Practice-based Learning and Improvement (PBLI) and SBP that provide a balanced approach to both self improvement and quality assessment within the context of system improvement.

1. Accreditation Council for Graduate Medical Education. Competency Language, http://www.acgme.org/outcome/comp/compHome.asp, accessed November 9, 2004..
2. Miles P. Closing the gap by redesigning the system. Proceedings of ABMS-ACGME Conference on Systems-based Practice; 2004 Sept 23-24; Rosemont, IL. http://www.abms.org/Downloads/Conferences/ClosingtheGapbyRedesigningtheSystem.pdf.

Kravet SJ, Wright SM, Carrese JA. Teaching resource and information management using an innovative case-based conference. J Gen Intern Med 2001;16:399-403.

At least four interrelated systems are addressed in the "Resource and Information Management Conference" for medical residents. The case-based conferences are designed to: 1) improve learners' knowledge of reimbursement in hospital medicine, such as the documentation and billing systems; 2) increase learners' awareness of the importance of managing resources (i.e., medicine unit patient care system and billing system); and 3) enhance learners' understanding of the importance of collaboration to provide efficient and effective health care, including community-hospital referral system, medicine unit patient care system, documentation and billing systems. Using case-based seminars, residents present and discuss aspects of patient care, including hospital-based care of patients, ambulatory follow-up care of patients from a primary care physician, the itemized hospital bill, appropriate documentation and coding, and comparison of charges generated with institutional and state averages. The conference is facilitated by an attending physician, who also selects cases representative of routine practice and discharged long enough that coding and billing information is available.

The facilitator invites guest presenters such as laboratory directors, pharmacists, financial management staff, representatives for utilization review and administrative nurses. Topics and issues raised during these seminars include the

roles of clinical and non-clinical staff in the hospital-based care system, the effect of specific documentation on coding and reimbursement, managed care and institutional accountability for resource utilization. By replacing one morning report session per month, the authors were able to integrate this conference into residents' busy schedules. According to participants, the conference has improved relationships between record coders and residents, increased resident understanding of hospital care costs and reimbursement, and improved resident attitudes toward practicing cost-effective medicine.

Matter, CA, Speice JA, McCann R, Mendelson DA, McCormick K, Friedman S, et al. Hospital to home: Improving internal medicine residents' understanding of the needs of older persons after a hospital stay. Acad Med 2003;78:793-7.

SBP helps to ensure that patients do not fall through fault lines in the health care system. A potential weakness in the system occurs when discharge planning does not consider post-hospitalization challenges to patient health. The article describes a Hospital-to-Home Program that uses an experiential learning approach to educate residents about this issue. As part of their geriatrics rotation, residents carry out a comprehensive pre-discharge patient assessment, conduct a home visit with the same patient, and present their findings during noon conference.

"During the home visit, the resident assesses areas such as home safety, medication management, costs and unforeseen complications. All patient encounters are videotaped with the patient's permission."

Participation in the program requires the residents to collaborate with their patients and the patients' families, the multi-disciplinary discharge team and the behavioral medicine faculty. During the pre-discharge assessment, the resident ascertains support systems and potential challenges to the patient's health in the home or rehabilitation setting including access to social support services, the need for durable medical supplies and resources available to access and purchase medication. During the home visit, the resident assesses areas such as home safety, medication management, costs and unforeseen complications. All patient encounters are videotaped with the patient's permission. The discharge plan and videotapes are then reviewed when the resident presents the case to faculty, peers and medical students. Using the information gathered during the home visit, steps for improving the plan are discussed and the resident reflects on what was learned from the experience. Feedback from residents to date suggests that the Hospital-to-Home Program has increased their understanding of resources needed by and available to patients in their home or rehabilitation settings, has increased their appreciation of working in teams and has highlighted the need to tailor discharge planning to the post-discharge environment.

Ziegelstein RC, Fiebach NH. "The mirror" and "the village": a new method for teaching practice-based learning and improvement and systems-based practice. Academic Medicine 2004;79(1):83-8.

The authors found that metaphors prove to be helpful teaching tools for Practice-based Learning and Improvement and SBP, especially since both faculty and residents encountered some conceptual difficulties in trying to understand these particular competencies. They introduced SBP using the metaphor of a village, "made famous by Senator Hillary Rodham Clinton when she said, 'It takes a village to raise a child.'" The image of the village emphasizes the importance of various communities or systems within which physicians must work to deliver effective care. Three specific training activities were used to teach and assess SBP. These included daily multidisciplinary inpatient rounds, monthly nursing evaluations of residents, and quality assessment – systems improvement exercises. The image of holding a mirror to oneself to "document, assess and improve practice" demonstrated Practice-based Learning and Improvement. Activities related to this competency included a weekly inpatient morbidity and mortality morning report, continuity clinic chart self-audits and resident learning portfolios. In the case of both competencies and corresponding sets of activities, the interrelationship of the competencies was clear, as was the emphasis on systems thinking and improvement. For instance, nurse managers' consensus reports helped residents recognize that members of "the village," i.e., other health professionals, have an important contribution to make in assessing professional competence. The subsequent improvements made in response to these evaluations become vital to the effective functioning of the entire system. A project involving quality assessment – system improvement resulted in effective changes to mammography scheduling and processing for women older than age 50. Follow-up retrospective rating by residents showed increased understanding and self-reported improvement in their ability to practice both competencies. ■

Patricia M. Surdyk, PhD is Senior Project Manager and Deirdre C. Lynch, RhD is Research and Evaluation Specialist at the Accreditation Council for Graduate Medical Education. Dr. Lynch also was the author of the first edition of "Competencies in the Press," which appeared in the February 2004 issue of the ACGME Bulletin.

RRC/IRC Column

Council approves revisions to the program requirements of Internal Medicine Subspecialties, Psychiatry, Child and Adolescent Psychiatry and Pediatric Radiology

At the September 2004 meeting, ACGME approved revisions to the Program Requirements for the Internal Medicine subspecialty programs of Rheumatology; Hematology; Hematology and Medical Oncology; Medical Oncology; Endocrinology, Diabetes and Metabolism; Nephrology; Gastroenterology; Infectious Disease; Cardiovascular Disease; Clinical Cardiac Electrophysiology; Interventional Cardiology; Pulmonary Disease; Critical Care Medicine; and Pulmonary Disease and Critical Care Medicine. The Council also approved the Program Requirements for subspecialties of Internal Medicine. The revised program requirements will become effective July 1, 2005. The revisions to the Program Requirements for Pediatric Radiology, Psychiatry, and Child and Adolescent Psychiatry, also approved at this meeting, became effective November 12, 2004.

ACGME also formally approved that revisions to the Common Program Requirements be initiated by the RRC Council of Chairs, and then forwarded to the Committee for Review of Program Requirements.

Update on Changes in the Institutional Review Procedure

ACGME discussed revisions in the institutional review process, moving it to an institutional accreditation process, in which institutions receive accreditation status designations currently reserved only for accredited programs. This change will be phased in beginning in 2005, as sponsoring institutions come up for their scheduled institutional reviews.

Other News from the September ACGME Meeting

Second and Third reports of the Ad Hoc Subcommittee on Duty Hours

D. David Glass, MD, Chair of the Subcommittee on Duty Hours, presented the Subcommittee's second and third reports. The Subcommittee was charged with advising the ACGME on issues relating to the initial implementation of the duty hour standards. The second report summarized the achievements over the first year of implementing the common duty hour standards in more than 7,900 accredited programs. The report lauded programs and their sponsoring institutions for their progress in adapting to the duty hours standards and initiating mechanisms for duty hour monitoring and oversight.

In its third report, the Subcommittee advised that following its Asunset@ in September 2004, the ongoing responsibilities of surveillance and compliance monitoring should be transferred to the three standing ACGME committees: the Monitoring Committee, the Committee on Program Requirements, and the RRC Council of Chairs. In addition, because resident duty hours are one aspect of the environment that provides the context for residents' educational and professional development, ACGME authorized the formation of a new "Committee on Innovation in the Learning Environment."

ACGME Self-Assessment

Mark A. Kelley, M.D., Chair, of the Strategic Initiatives Committee, presented the results of a discussion of a Self-assessment of the ACGME, focusing on its effectiveness as an accrediting organization. The aims of the self-assessment include:

1. Collecting broad input from leaders and constituents;
2. Developing a set of measures of ACGME effectiveness;
3. Facilitating an ongoing assessment of ACGME's effectiveness; and
4. Identifying opportunities for improvement.

Input from all member and appointing organizations, program directors, DIOs and others was compiled into key themes. The results of the Committee's discussions were presented to the ACGME Executive Committee at its November 2004 retreat, and the product of their deliberation will be presented to the ACGME at the February 2005 meeting.

Monitoring Committee Coordinates Duty Hour Compliance Efforts

Wm. James Howard, MD, representing Duncan MacDonald, the Committee's chair, gave the report of the Monitoring Committee, which included a summary of its review of compliance with the duty hour standards and related issues for academic year 2003-2004. The Monitoring Committee has assumed the responsibility for reviewing duty hour compliance data both at the time of the periodic review of RRC, and on an ongoing basis, and also remains committed to identifying best practices. Successful approaches for reducing hours preserve a balance between education and service and could be adopted or adapted by other programs and institutions.

To ensure a consistent application and enforcement of the standards across RRCs, the Monitoring Committee review the data from the program director and resident surveys on duty hours, information from duty hour citations given by each RRC and information on the follow-up to alleged non-compliance with the duty hour standards, including adverse actions, shortened cycles, progress reports and other follow-up. During the 2004-2005 academic year, the Committee will review this information, to look for patterns and trends. The Committee also plans to report all developments, trends or changes at each ACGME board meeting.

Two Members Reappointed to the Transitional Year Review Committee

ACGME reappointed two members to the Transitional Year Review Committee, Nadine Bruce, MD, and Ann Skelton, MD. Their terms of office are from July 2004 to June 2007.

ACGME Co-Sponsored Conference on Safety Net Hospitals

In July 2004, ACGME and the Association of Academic Health Centers (AAHC) co-sponsored a Symposium entitled "Good Learning for Good Healthcare in Safety Net Institutions." The primary aim was to identify initiatives and programs in safetynet hospitals that have had a positive impact on resident education. The conference also sought to identify

> "The primary aim was to identify initiatives and programs in safety net hospitals that have had a positive impact on resident education."

and explore issues and challenges these institutions confront related to their operation of residency programs. Attendees included CEOs and Designated Institutional Officials from institutions that organize and deliver a significant level of health care and other related services to the uninsured, Medicaid beneficiaries and other vulnerable patients. A second conference to further address the topic is being planned, to be led by AAHC.

Emmanuel Cassimatis, MD, new ACGME Chair

At the September meeting, the ACGME said farewell to its chair, Charles (Chip) Rice, MD, AAMC, on the completion of his two-year tenure as ACGME Chair. The new Chair is Emmanuel G. Cassimatis, MD, American Medical Association. Dr. Cassimatis is the Associate Dean for Clinical Affairs of the Uniformed Services University of the Health Sciences, Bethesda, Maryland.

Dr. Charles (Chip) Rice, MD, ACGME Chair 2002/04 (right) passes the gavel to Dr. Emmanuel Cassimatis, MD, incoming Chair (left).

Ron Berggren, MD, receives John C. Gienapp Award; Ten Program Directors Receive Parker J. Palmer Award

The ACGME selected Ronald Berggren, MD, a two-time former Chairman of ACGME, and former Chair of the Institutional Review Committee, to receive the John C. Gienapp Award for 2005. The Council also selected 10 residency program directors, listed below, to receive the 2004 Parker J. Palmer "Courage to Teach Award." This the fourth time the Parker Palmer Award has been presented. The recipients will be honored at the reception and dinner in conjunction with the February 2005 ACGME meeting.

Recipients of the 2005 Parker J. Palmer Courage to Teach Award

Patricia Blanchette, MD
University of Hawaii
Internal Medicine, Geriatrics

Francis Counselman, MD
Eastern Virginia Medical School,
Emergency Medicine

Daniel Dedrick, MD
Brigham and Women's Hospital
Anesthesiology

Richard Dow, MD
Dartmouth-Hitchcock Medical Center
General Surgery

David George, MD
The Reading Hospital
Transitional Year

Mark Juzych, MD
Kresge Eye Institute
Ophthalmology

Anthony Meyer, MD
University of North Carolina
General Surgery

Teresa Massagali, MD
University of Washington
Physical Medicine and Rehabilitation

Glenn Newell, MD
UMDNJ-Robert Wood Johnson, Camden
Internal Medicine

Eric Scher, MD
Henry Ford Hospital
Internal Medicine

Exploring Subspecialty Accreditation: Ophthalmology's Experience

Richard P. Mills MD MPH

Ophthalmology was the first specialty to embrace board certification; it is one of the last holdouts to implement accreditation for its subspecialty fellowship programs. Recently, the ophthalmology community had an opportunity to reexamine both subspecialty fellowship accreditation and subspecialty certification in a formal process, and it rejected both. The saga of that process may be useful to other specialties facing similar fellowship accreditation decisions, and to those who have already made them years ago. To keep the story short, this article describes only the accreditation debate.

The saga begins in 1993, in a rare display of unanimity, when the three societies representing retina and vitreous subspecialists asked The American Board of Ophthalmology (ABO) to support a request for accreditation of retina-vitreous fellowship programs to the ACGME. After much deliberation, the ABO declined to support this relatively small specialty of ophthalmology, to avoid fragmentation. By 1996, other ophthalmology subspecialty societies had joined the chorus requesting fellowship accreditation. A formal process of discussion was initiated, brokered by the ABO and the American Academy of Ophthalmology (AAO), with open forums and symposia held at major ophthalmology meetings over two years. This produced a recommendation that fellowship program accreditation would be in the best interest of the public, by improving the quality of the education process, and in the best interest of the trainees, by protecting their interests. This remarkable consensus had the tacit approval of the general ophthalmologists, represented by the AAO, the subspecialists, represented by their respective societies, the training programs, represented by the Association of University Professors of Ophthalmology (AUPO) and the ABO.

"This produced a recommendation that fellowship program accreditation would be in the best interest of the public, by improving the quality of the education process, and in the best interest of the trainees, by protecting their interests."

A Task Force was created. In the fall of 1997 this group recommended that accreditation be pursued for the subspecialties of Cornea, Glaucoma, Retina-Vitreous, Neuro-ophthalmology, Pediatric Ophthalmology, Ophthalmic Pathology and Oculoplastics. The ABO, with the help of the relevant subspecialty societies, constituted seven subcommittees to design standards for training in each of these subspecialties. An ABO director of a different subspecialty was assigned to each subcommittee to ensure that the standards were being written for educational reasons and that a common format was followed. All but one of the documents were approved by the ABO and they were forwarded as a group to the ACGME in May 2000. The ACGME staff, working in concert with the Ophthalmology RRC, refined the documents, inserting common program requirements and other information to conform to ACGME policy.

"With departments already feeling "squeezed" by reductions in traditional sources of support, some chairs felt they could be forced to abandon fellowship training, and others feared that resident education could be hurt because educational dollars could be diverted to fellows."

The organization of the chairs of ophthalmology, the AUPO, sponsored a symposium on fellowship accreditation in February 2002. In the course of that meeting, the fact that fellows in an accredited program would not be able to bill for patient care services became an issue. This resulted in concern that without income from patient care, and with the cap on Medicare funding for additional positions, the only possible source for fellow salaries would be departmental resources. With departments already feeling "squeezed" by reductions in traditional sources of support, some chairs felt they could be forced to abandon fellowship training, and others feared that resident education could be hurt because educational dollars could be diverted to fellows.

After extensive discussion, the AUPO voted not to support fellowship accreditation, writing a letter to Dr. Leach, Executive Director of the ACGME. The chairs recognized the educational value of training standards, and proposed an alternate scheme for voluntary fellowship "approval", to be administered by the AUPO. Fellowship programs could voluntarily choose to follow standards similar to those being considered by the ACGME, and the expectation was that one factor in prospective fellows' choices among programs would be participation in this approval process. Trainees would not be labeled "residents" by Medicare, and would retain the ability to bill for patient care.

The AUPO leadership saw this alternative pathway as an acceptable compromise, but it did throw down a gauntlet to the ACGME. To his credit, Dr. Leach did not view the proposal as a threat to ACGME, but saw it as a step toward the eventual goal of subspecialty accreditation. He instructed the ophthalmology RRC to review the situation using the ACGME criteria for new fellowship accreditation, and recommend whether to proceed with or halt the implementation of ACGME fellowship accreditation as proposed by the ABO.

In June 2003, the Ophthalmology RRC was swayed by concerns about potential negative effects on the quality of residency programs in instances where fellows would dilute precious educational resources. There also were concerns some fellowship programs might close, because they could not afford participation in the accreditation process, and would not want to run a non-accredited program that would be viewed as "second-class." The RRC felt this would not be in the public's best interest. The committee also recognized that Medicare

"There also were concerns some fellowship programs might close, because they could not afford participation in the accreditation process, and would not want to run a non-accredited program that would be viewed as "second-class." The RRC felt this would not be in the public's best interest."

rules change. The advantage of having trainees in a non-ACGME accredited programs be able to bill Medicare for services could disappear, or Medicare's cap on the number of funded residency positions might be lifted, making it possible to obtain Medicare support for new fellowships. Recognizing that these and other future events could make the pursuit of ACGME fellowship accreditation more desirable, the RRC voted to table the decision at this time. It retained the nearly finalized draft Program Requirements, ready to revisit them if and when the accreditation landscape would change. The RRC also invited the subspecialty societies to advance additional arguments why fellowship accreditation should move forward.

Educational decisions should be made on purely educational grounds. If accreditation improves the quality of training, and there is little doubt that it does, it should be implemented. Unfortunately, one of the functional realities is

"Educational decisions should be made on purely educational grounds. If accreditation improves the quality of training, and there is little doubt that it does, it should be implemented."

that residency education in all specialties is scrambling for resources, and many feel that teaching is poorly rewarded at the individual, program and institutional level. One may think resident education should be in sorry shape, yet it is not. The saving grace is that teaching is, and always has been, a labor of love. The talented and dedicated individuals who mentor young physicians feel they receive the greatest satisfaction of all – the success of their trainees. They keep the quality of education high in spite of some current incentives working in the opposite direction.

What lessons have we learned that may be useful to others? First, no matter how exhaustive and prolonged, discussions prior to the threshold of implementation of subspecialty accreditation do not immunize against the sudden appearance of significant opposition. Second, although education decisions must be made on educational grounds, financial realities can have significant impact and should be thoughtfully considered. Finally, if your specialty is worried about missing the bandwagon of subspecialty accreditation, it will have Ophthalmology as company if you choose to watch the parade and not march in it. ■

Richard P. Mills MD MPH is the Vice Chair, RRC for Ophthalmology and a Clinical Professor of Ophthalmology at the University of Washington, Seattle.

National and International News about Graduate Medical Education

ABMS Announces All Member Boards Participate in the Maintenance of Certification

In November 2004 the American Board of Medical Specialties (ABMS) announced that its 24 Member Boards have committed to participating in Maintenance of Certification (MOC). By the end of the year, the boards will submit initial plans for all phases of MOC, which moves recertification from a periodic undertaking to a more ongoing assessment focusing on the six general competencies for physician practice identified jointly by ABMS and ACGME.

Nearly 90% of licensed physicians in the nation are certified by an ABMS Member Board, and thus the vast majority of the nation's physicians will be involved in MOC. Formulating the process was initiated in 1998-99; its development involved a broad spectrum of medical and surgical specialties, and was done in concert with ACGME's development of the competencies for graduate medical education. MOC is supported by many health care organizations, including the American Medical Association, American Hospital Association, National Board of Medical Examiners, Federation of State Medical Boards, Joint Commission on Accreditation of Healthcare Organizations, Council of Medical Specialty Societies, the Association of American Medical Colleges, and the Educational Commission for Foreign Medical Graduates.

"Nearly 90% of licensed physicians in the nation are certified by an ABMS Member Board, and thus the vast majority of the nation's physicians will be involved in MOC."

Some British Physicians in Training Consider Leaving Medicine in the United Kingdom

The November issue of the BMJ featured a survey of British physicians in training, offering information on "junior doctors'" perceptions of medical practice in the United Kingdom.[1] Of 1,326 respondents, the majority reported they would like to remain in medicine, though sizable percentages indicated a preference for living in another country (65%) and cited working conditions in the United Kingdom as a reason for interest in practicing abroad (41%). Of the 279 respondents who reported contemplating leaving medicine, 75% cited working conditions, 23% cited lifestyle reasons, and 9% cited interest in another career. The authors noted that while life style preferences are less amenable to policy solutions, efforts to improve physicians' working environment in the United Kingdom might induce the respondents who cited working conditions into remaining in medicine.

"Of 1,326 respondents, the majority reported they would like to remain in medicine, though sizable percentages indicated a preference for living in another country (65%) and cited working conditions in the United Kingdom as a reason for interest in practicing abroad (41%). Nearly 90% of licensed physicians in the nation are certified by an ABMS Member Board, and thus the vast majority of the nation's physicians will be involved in MOC."

The article references reductions in physician work hours in the United Kingdom as a result of the European Working Time Directive. The authors commented that these efforts address long duty hours as a deterrent to practice in the United Kingdom. At the same time, the need for access to care may require that these conditions at least partially continue for some period. The authors referenced a Royal College of Physicians report entitled, "The further implementation of the European Working Time Directive to cover junior doctors in training," that noted concerns whether the reductions in hours leave enough time for physicians to gain adequate experience for independent practice. ■

[1] Moss, PJ, Lambert TW, Goldacre MJ, Lee P. Reasons for considering leaving UK Medicine: questionnaire study of junior doctors' comments. British Medical Journal 2004; 329:1263-8, originally published online 6 Oct 2004; BMJ

Update on New York's Experience with Resident Duty Hours Limitations and Compliance Efforts

Tim Johnson

New York teaching hospitals have been subject to resident working hour limitations since July 1989. While the ACGME has been carefully developing and implementing resident duty hours standards that apply to all accredited residency programs, the New York State Department of Health has been conducting a separate and thorough compliance effort over the last three years in response to earlier findings that most New York teaching hospitals had not been able to achieve full compliance.

Background

The New York initiative grew out of unannounced visits to twelve teaching hospitals throughout the state in 1998, nearly ten years after the duty hour limits had been instituted. This found that all hospitals visited had some degree of noncompliance. In general, the visits demonstrated that residents were being properly supervised but reviews of resident schedules and interviews with trainees showed noncompliance with the aspects of the State's regulations that pertained to the limits on duty hours. Following the publication of these results, the Department of Health conducted visits to teaching hospitals on a periodic basis and also investigated credible complaints.

When the Health Care Reform Act (HCRA), New York's legislation that deregulated the hospital's inpatient rate setting system, was up for renewal in 1999, residency trainee advocates successfully lobbied the State to add a provision to the Act that directs the Commissioner of Health to conduct annual compliance reviews. The renewed legislation also appropriated funds for these reviews to be conducted. The resulting Hospital Compliance Review Program, as it is called, is built around an independent organization (the Island Peer Review Organization or IPRO) under contract to the State making dedicated visits to every teaching hospital in the state to assess duty hour compliance. The contractor conducts interviews with residents, examines medical records, and reviews rotation schedules, and reports its findings to the Department of Health, which ultimately determines compliance or noncompliance with particular aspects of the State regulations. A finding of noncompliance results in a statement of deficiency issued to the hospital, and a request for a plan of correction. In certain instances, the findings are referred for enforcement. This generally consists of a financial penalty to the hospital.

The final year of the initial three-year contract concluded September 30, 2004, and the evidence demonstrates that New York's teaching hospitals have done a remarkable job in coming into compliance with the duty hour limitations.

Evolution over the Three-Year Period

Increased Compliance

In the first year of the reviews under the State contract, only 36% of the facilities surveyed were able to demonstrate full compliance with the regulations. In the second year, that number increased to 58%. The most recent set of reviews during Year 3 found that approximately 80% of the visits resulted in a finding of full compliance. While the Department of Health and hospital representatives note that there is fine-tuning to be done on specific programs and specific situations to bring those areas into full compliance, the parties also agree that the hospital compliance efforts have been exemplary.

Surgical Programs' Efforts toward Compliance

In the initial set of surveys by both DOH and IPRO, the surgical programs had the most difficulty achieving compliance. This was due in part to the demands of the surgical training and also to program efforts to comply with a complicated sub-provision within the regulations that allowed for extended continuous training for surgery residents if certain additional requirements were met. The additional requirements specify that the continuous training period for a surgical resident can be extended beyond 24 consecutive hours if the hospital is able to document that the resident received adequate rest during the on call period. After some discussion, the Department of Health defined an adequate rest period as

"In the initial set of surveys by both DOH and IPRO, the surgical programs had the most difficulty achieving compliance. This was due in part to the demands of the surgical training and also to program efforts to comply with a complicated sub-provision within the regulations that allowed for extended continuous training for surgery residents if certain additional requirements were met."

4-5 hours of continuous, uninterrupted rest. While many programs tried to comply with this requirement, the demands of a busy teaching hospital often made such a scenario impossible to achieve, much less document. As a result, most of the surgery training programs decided to limit the continuous period to 24 consecutive hours, as it is for all other programs, and most of these programs have been able to achieve full compliance. In fact, the Department of Health has recently noted that the areas that require additional attention are now almost evenly split between surgery programs and medicine programs.

The Need for Annual Surveys

Because the HCRA legislation mandated annual compliance surveys, and there was evidence that most hospitals showed at least some degree of noncompliance, the State's contracted review program specified that all teaching hospitals would be visited on an annual basis for the three years of the initial contract. Since the most recent data shows that New York hospitals are in compliance or need minor additional work in certain specific areas, questions have been raised regarding the ongoing need for annual compliance reviews of every New York hospital.

"Since the most recent data shows that New York hospitals are in compliance or need minor additional work in certain specific areas, questions have been raised regarding the ongoing need for annual compliance reviews of every New York hospital."

In addition, as the ACGME has developed and implemented standards that are very similar to the New York regulations, some hospital staff representatives have raised questions regarding the need for the overall New York program. There are minor areas of difference, most particularly the limit on post-call transition time (New York State's policy limits the number of hours to three, effectively eliminating the possibility of post-call didactics), but the two sets of requirements are otherwise almost exactly the same.

While the need for the surveys will continue to be discussed and debated among policymakers, it is clear that New York hospitals have done a remarkable job in three years of moving to near-perfect compliance. ■

Tim Johnson is the Vice President, Finance and Graduate Medical Education of the Greater New York Hospital Association, New York, New York.

Making the Case for Re-Engineering the Learning Environment

Ingrid Philibert

The first year under the new common duty hour standards has left us with a better understanding that high-quality education under reduced hours will necessitate a revamping of the interface between clinical care and education. That change is needed, going beyond a re-examination of the standards to an in-depth assessment of the clinical and learning activities of residents, is evident from studies published in the New England Journal of Medicine about first-year residents' experiences working long hours in the ICU.[1,2] It also emerges from ACGME data that show in programs in which more than 15% of the residents work beyond the 80-hour weekly limit, a lower percentage of the residents indicated satisfaction with their learning environment, a smaller percentage felt their program emphasized patient safety, and a smaller percentage reported that their supervision was adequate and prompt."[3]

Re-engineering the work in teaching settings appears to be the response. The term re-engineering got a bad name through its use for draconic cost reduction efforts and less than optimally constructed efforts to change the flow of work, and future attempts at re-engineering will need to provide authentic improvements in the clinical-educational interface. What is increasingly being understood is that the work of residents has been changing all along, with factors including new technology, increased acuity, and shortened and fractured exposure to patients. Yet the educational model has changed relatively little since the 19th century, and major current initiatives like the six general competencies and limits on resident hours often are "grafted" onto the traditional paradigms of how residents have been trained.

There are reasons for this. One is that the current educational model places a high value on active participation in clinical care. This focus on full clinical engagement has contributed to duty hours that cannot be justified from the perspective of the science on sleep and performance. Strict adherence to that science, without changes in the education model, has the potential of resulting in residents who are disconnected from their current primary source of learning – the patient encounter.

How should we revamp the clinical-educational interface that is at the basis of the work in teaching settings? Other industries may be ahead of medicine in this respect. In some domains, "engineering of the work" has specific meaning. We have encountered this in a limited fashion as we have sought to understand human performance in the context of assessing the effect of sleep loss and in efforts to enhance patient safety.

As a science, cognitive engineering is concerned with work performed in "a cognitive system, composed of human and machine agents in a work domain that is delineated by roles, work and communication norms, artifacts, and procedures."[4] This has shown that the model in the system designer's head likely differs from those in the heads of the users as they interface with the system.[5] This is useful in contemplating the effect of the duty hour limits from the residents' perspective, as they live with the results of programs' and institutions' efforts to bring hours within the limits required by the standards.

The "systems-based practice" knowledge of many residents now include observations gathered as well-intended interventions to reduce hours in their immediate environment have unintended and undesirable consequences. Examples include efforts to compress work into fewer hours, or expand the scope of activities through cross-coverage. Some of these

"The "systems-based practice" knowledge of many residents now include observations gathered as well-intended interventions to reduce hours in their immediate environment have unintended and undesirable consequences."

have had consequences that were counter to the gains in resident well-being and learning and patient safety duty hour limits were intended to achieve.[6,7] Even technology applied explicitly to reduce residents' work or to make it safer can have unintended effects.[8]

Some specialties like anesthesiology have used the concepts of cognitive engineering to explore the human-machine interface in a technology-rich environment.[9,10] There have been relatively few efforts to more broadly assess residents' working and learning environment, using cognitive or systems models. The duty hour limits and other changes occurring in the system create a need and an opportunity to begin to explore the learning environment from a number of perspectives, including cognitive engineering. This may find that the patient encounter is not the sole or best source of learning. A metaphor in a presentation by Richard Reznick, MD, a Colorectal surgeon and educator from the University of Toronto, Canada, at the September meeting of the American Board of Medical Specialties, illustrates this well. Dr. Reznick described his son's experience as a hockey goalie. By providing tallies of the number of pucks deflected in solo practice, team practice and during games, he was able to clearly show that only a small fraction of this son's "exposure" to pucks occurred in "high-stakes" real game situations. This contrasts with residency where, albeit with supervision, much of the "learning" occurs in caring for real patients.

The attention of the residency education community and public is focused on the duty hour limits. Though not yet fully appreciated by both groups, the limits create a need for knowledge on how "natural" changes and interventions affect the learning environment, though the time for this appraisal may have come in the absence of the limits on resident hours. The newly formed ACGME Committee on Innovation in the Learning Environment will begin the work of broadening the examination of the systems that provide the context for resident learning and patient care. ■

[1] Lockley S et.al. Effect of reducing interns' weekly work hours on sleep and attentional failures. NEJM. 351:18; 1829-1837.

[2] Landrigan CP et al. Effect of reducing interns' work hours on serious medical errors in intensive care units. NEJM. 351:18; 1838-1848.

[3] ACGME, Resident Survey, Data from February/March 2004, respondents reported the number of hours worked during their most recent 4-week rotation and provided data related to compliance with ACGME standards relating to supervision and other aspects of their learning environment.

[4] Roth EM, Patterson, ES. Cognitive Engineering: Issues in User-Centered System Design. To appear in: Roth, E. M., Patterson, E.S. & Mumaw, R. J. Cognitive Engineering: Issues in User-Centered System Design. In J. J. Marciniak (Ed.), Encyclopedia of Software Engineering, 2nd Edition. New York: Wiley-Interscience, John Wiley & Sons. http://csel.eng.ohio-state.edu/emily/cog_eng_def.pdf, accessed November 8, 2004.

[5] Norman DA. Cognitive Engineering. In Norman D and Draper S, User Centered System Design. 1986; Hillsdale: Lawrence Erlbaum Associates.

[6] Gelfand DV, Podnos YD, Carmichael JC, Saltzman DJ, Wilson SE, Williams RA. Effect of the 80-Hour Workweek on Resident Burnout. Arch Surg. 2004;139:933-940.

[7] Petersen LA, Brennan TA, O'Neil AC, Cook EF, Lee TH. Does housestaff discontinuity of care increase the risk for preventable adverse events? Ann Intern Med. 1994 Dec 1;121(11):866-72.

[8] Vicente KJ. Less is (sometimes) more in cognitive engineering: the role of automation technology in improving patient safety. Qual Saf Health Care 2003;12:291-294.

[9] Cook R, Woods D, McDonald J. Human performance in anesthesia: A corpus of cases: Cognitive Systems Engineering Laboratory of Department of Industrial and Systems Engineering, Ohio State University, 1991.

[10] Howard SK, Gaba DM, Fish KJ, Yang G, Sarnquist FH. Anesthesia crisis resource management training: teaching anesthesiologists to handle critical incidents. Aviat Space Environ Med. 1992 Sep;63(9):763-70.

"By providing tallies of the number of pucks deflected in solo practice, team practice and during games, he was able to clearly show that only a small fraction of this son's "exposure" to pucks occurred in "high-stakes" real game situations. This contrasts with residency where, albeit with supervision, much of the "learning" occurs in caring for real patients."

IN THIS ISSUE OF ACGME BULLETIN

ACGME

Accreditation Council for Graduate Medical Education

515 North State Street
Suite 2000
Chicago, Illinois 60610

NON-PROFIT ORG.
U.S. POSTAGE
PAID
ACGME
PERMIT NO. 9451
CHICAGO, IL

Change of Address:
Requests for a change of address should be sent to the editor at the address given above. Please include a copy of the mailing label from the most recent copy of the ACGME Bulletin along with your new address.