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Enhancing the Focus on Safety and Quality in Resident Education

Patient Safety as Nodes and Ties in a Social Network

At a recent roundtable on the design of a patient safety curriculum for health professionals, held in conjunction with the summer 2006 conference series at the Telluride Science Research Center, participants assumed the roles of various patient safety stakeholders – patients, providers, institutions, payers, learners, researchers and accrediting organizations.¹ They unrolled a ball of yarn between one another to represent ties between the actors. The emerging web of links between them highlighted the social network of patient safety, as the yarn made visible the unseen connections and forces.

In most social networks, ties have different strengths, expressing varying degrees of closeness, congruence and collaboration on matters of mutual relevance.² Some nodes in the network have more links than others. In the ad hoc network assembled by the conference participants, research occupied a central place, with stakeholders interested in applying scientific results to enhance safety. Payers and learners (residents and medical students) also had quite a number of links. Other network nodes had barely any.

This issue of the *ACGME Bulletin* seeks to make visible the network around patient safety in resident education. The size of this network is evidenced in the range of articles and topics in this issue, held together by a collective focus on physician education and the safety and quality of care. Topics range from Leach's and Powell's articles about the benefits of constraining individual discretion to achieve safer health care to Friedman's description of how the University of Florida enhances safety in neurological surgery through a transition period that creates a bridge between residency and independent practice. Research and innovation are represented by the description of technological innovation in procedural simulation provided by Banerjee and Charbel, and Kochar and Connelly's article about a patient safety elective at the Medical College of Wisconsin.

The work of Everett Rogers has stressed the importance of social networks in the dissemination of innovations.³ This requires bridging activities that place the organization into a larger context, a context that may affect its power stature. Westrum's typology of organizations – pathological, bureaucratic and generative⁴ – has among its parameters the extent to which entities welcome bridging activities that place them in a broader context where the individual



Resident Formation: Getting Autonomy Right

David C. Leach, MD

Autonomous: ...undertaken or carried on without outside control; existing or capable of existing independently; responding, reacting or developing independently of the whole...¹

organization's powerbase and degree of control may be subordinate to a greater good. Pathological organizations actively discourage bridging, bureaucratic organizations merely tolerate it, and only generative organizations encourage it as being critical to accomplishing their work.

The articles in this issue draw attention to the many elements of the health care system that have to come together to ensure safe care, and to some of the bridging activities that occur already. The community has learned that safety cannot be achieved through individual attention and vigilance alone, and requires attention to system factors.⁵ At the same time, interest in safety as a systems-property does not imply that safe care can be achieved without the engagement and contributions of the individuals in the system. Casarett and Helms have perceptively stated "...academic medical centers must achieve a delicate balance that protects patients from the error that a systems approach can identify, yet provides optimal education for house officers by teaching them to focus also on personal reasons for errors."⁶ The question that remains is how to do this, and not risk damaging learners' self-esteem or their very career in medicine.

The social network around safe care and education extends into the curriculum and evaluation systems used in residency. Curricula and assessment focus on the spectrum of medical practice, but patient safety is a central concept without which high-quality care and learning are not possible. The description of the MedEdPORTAL online curriculum resource by Androlsek and Chandler is relevant in this context, by facilitating dissemination and vetting of a range of materials including safety curricula and information on sleep loss and performance. The article on program evaluation by Knight et al. is outside the narrow realm of patient safety, but one could envision a system that matched evaluation to a program goal of promoting safe systems of care and learning, adapting the tool described by the authors. The article by Gosbee, Williams and Dunn represents the third update on progress in the effort by the VA National Center for Patient Safety to develop and use broad curricula to teach residents and other frontline care givers patient safety concepts and tools. This effort across a range of health professions and federal and non-federal settings is an exemplar of how different organizations can be bridged to achieve safe care. ■

Imagine a surgeon entering an operating room and preparing to operate on an elective case unscrubbed and perhaps wearing no gloves... Even the housekeeper would be comfortable saying, "Doctor, you can't operate without scrubbing." A few years ago Jim Reinertsen presented this example and challenged an audience to think of other examples in which an individual physician's autonomy might be constrained. He made the point that despite reams of regulations, deference to individual judgment informs much of our clinical behavior.

We teach our residents as we were taught, that the most important thing they will offer their patients is their clinical judgment. Yet safety experts tell us that you cannot have both autonomy and safety; safety depends on "equivalent actors," in the words of Rene Amalberti.² Class I anesthesia cases and blood banking have achieved a level of safety much greater than that present in most clinical work, and they have done so by making it almost impossible to deviate from established, evidence-based protocols.

Yet the answer is not as simple as all physicians becoming equivalent actors. There are clinical phenomena that require individual responses to their particular attributes. Paul Batalden³ points out that treating a routine case of community-acquired pneumonia by whimsically selecting the antibiotic du jour makes health care less safe. On the other hand, treating a complex pneumonia in an immuno-compromised patient using the guidelines for community-acquired pneumonia also makes health care less safe. How can the medical profession get discretionary and disciplined judgments right? How do we teach residents to get it right?

Getting discretion and discipline right for residents

It begins by seeing things as they really are. This virtue, a form of prudence or practical wisdom, is at the heart of good medicine. Residents observe what we notice about patients, how we make sense of what we notice, and how we decide what to do based on this "sensemaking," using a frame provided by Karl Weick.⁴ Paying attention to and being explicit

¹ Designing a Patient Safety and Quality Outcomes Health Science Curriculum, Telluride Science Research Center, July 3–August 6, 2006, Telluride, supported by grants from the University of Illinois and Southern Illinois University.

² Scott J. Social Network Analysis: A Handbook. New York: Sage Publications. 1991.

³ Rogers, E. M. Diffusion of innovations, New York, NY: The Free Press. 1995.

⁴ Westrum R. A typology of organisational cultures. *Qual Saf Health Care* 2004; 13 (Suppl 2): ii22-ii27.

⁵ Corrigan, Janet M.; Donaldson, Molla S.; and Kohn, Linda T.; eds., *To Err Is Human: Building a Safer Health Care System*. Committee on Quality of Health Care in America, Institute of Medicine. National Academy Press, Washington, DC, 2000.

⁶ Casarett D, Helms C. Systems errors versus physicians' errors: finding the balance in medical education. *Acad Med*. 1999;74:19-22.

about what we notice and how we make sense of uncertainty and emerging clinical patterns may help residents acquire this skill. Experienced clinicians see patterns and recognize disease almost intuitively; they have seen it so many times before. Residents lack this experience and at best have a textbook description of the disease. Being explicit (i.e., having a patient-based curriculum) about the proper use of discretion and the proper adherence to evidence-based guidelines in the care of particular patients can foster deeper knowledge about prudence.

There also is knowledge of evidence-based protocols; understanding the relationships between disciplined care and safe care; and the use of simulation and other forms of practice and rehearsal that enable residents to build knowledge and experience in a safe environment. Unlearning is also needed, namely, that individual discretionary judgment is not always better and safer.

In addition, it helps to get accountability right. Accountability to patients and to fellow team members is a given, but accountability to the other health professionals working together in a system, to the institution in which one works, and to the larger health care system is important as well. One way of doing this is to link evaluations to system improvement. The preventive medicine residency at

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Dartmouth Medical School has done this. This residency is only offered to Dartmouth residents in one of nine categorical programs. Combined with the categorical program, it adds two years to a resident’s education, during which he/she gains a masters degree in public health and becomes board eligible in preventive medicine as well as their categorical program.

Providing a framework

Preventive medicine as a stand-alone specialty has not been growing. The approach to combine it with a core specialty in the Dartmouth program has generated real excitement, and has allowed the program to become the largest in the country. Limited to Dartmouth residents, the program is approved for 40 positions. There is early evidence that some residents are applying to the categorical programs just to get into the combined program, and the practicum year is viewed as an attractor. During that year the resident must fix a system problem. Dartmouth regularly puts its clinical outcomes on a public web site (www.dartmouth-hitchcock.org). The CEO and the program director ask the resident to identify an area in which Dartmouth can improve, such as the treatment of

community-acquired pneumonia. The resident, reporting directly to the CEO, improves health care. The CEO is enthusiastic and has given financial support to the program because it enables the system to achieve the common goal of improving Dartmouth’s clinical outcomes and enhancing resident education. The resident’s grade depends to some extent on his or her success in improving the system.

“Residents know that their future will call on them to have the skills needed to change and improve health care. Accountability at the system level exposes the goodness of both discretionary and disciplined behavior.”

Residents are not naïve. They know that their future will call on them to have the skills needed to change and improve health care. They are attracted to educational systems that prepare them for that task. Accountability at the system level exposes the goodness of both discretionary and disciplined behavior. To achieve system improvement, residents and all of us must acquire four helpful habits: we must tell the truth about clinical outcomes, preferably through a public web site; we must respect the opinions of others; we must be tolerant of dissent; and we must have humility and be willing to subject our work to review by others.

Dee Hock has said that it is possible that the most concise definition of an organization is simply “agreement.” Agreement is always dynamic, imperfect and malleable. Reaching and sustaining agreement is a continual process, a process in which we don’t admit to certainty or perpetuity, especially in particulars. It requires trust, tolerance and mutual caring.⁵ Healthy organizations educe behavior – they bring or draw forth something already present in a latent or undeveloped form.⁶ Educated behavior is inherently constructive. Just as surgeons learned the importance of scrubbing before surgery, the larger community can get discretionary and disciplined behavior right. We also can teach residents how to get it right: we have to tell the truth about outcomes; become fully informed about evidence; and measure system and individual performance. It takes a thoughtful and experienced community to get discretion and discipline right. ■

¹ Webster’s New Collegiate Dictionary, G. & C. Merriam Co., 1981.

² Amalberti, R., Auroy Y, Berwick D, Barach P. Five system barriers to achieving ultrasafe health care. *Annals of Internal Medicine*. 2005 May; 142 (9): 756-64.

³ Batalden P. Dartmouth Health Care Improvement Leadership Development 13th Annual Summer Institute, July 17, 2006.

⁴ Weick K. *Making sense of the organization*. Blackwell Publishing, 2000.

⁵ Hock D. *One from many*. Berrett-Koehler, 2005, p. 66.

⁶ *Ibid.* p. 93.

Transition to Practice: Recapturing the “Chief Residency”

William A. Friedman, MD

Introduction

The Program Requirements for Residency Education in Neurological Surgery mandate 6 post-graduate years of training. Approximately half of the neurosurgical training programs have received permission from the Residency Review Committee to extend the length of training to 7 years. The last year of training is the “chief resident” year. The requirements stipulate that “the chief resident must have major or primary responsibility for patient management with faculty supervision.”

Multiple forces have made it more difficult to satisfy that stipulation. First, decreasing reimbursement and declining state support for medical education have placed great pressure on neurosurgical faculty to perform ever increasing numbers of

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cases. The clinical income from those cases is required to support the clinical, research, and educational missions of many academic neurosurgical departments. This pressure, in turn, necessitates greater efficiency in the operating room, more cases must be done per surgeon per day. This means that the opportunity for the chief resident to have “major or primary responsibility” for the surgical portion of patient management is decreased.

Second, teaching physician rules require that the faculty surgeon be immediately available for all of a surgical case and be present for the “key portion.” So even emergency, night-time cases cannot be done by the chief resident without major faculty presence without sacrificing a billing opportunity. Likewise, the attending surgeon must be actively involved in the outpatient clinic visit to bill.

Third, patient expectations have changed. Many patients who are referred to an academic neurosurgeon want to know specifically whether that faculty surgeon will be doing all of their operation or whether a “student” will be involved. They are usually comfortable with a resident as “assistant surgeon” but not at all comfortable with the idea that an individual in training, regardless of how advanced, will have “major or primary” responsibility for their surgery. In our practice in Gainesville, most of our patients are long-distance

referrals from other neurosurgeons and neurologists. They are referred for the specific expertise of individual faculty members. They are not interested in residency education.

Fourth, many states, including Florida, have oppressive malpractice environments. Adverse outcomes are inevitable in neurosurgery. Those outcomes may be better accepted by the patient and their family if a faculty neurosurgeon is principally involved in the case from the initial clinic visit onward.

In an effort to address these challenges to the traditional chief residency experience, the Department of Neurosurgery at the University of Florida has altered the structure of its training program by creating the “Transition to Practice” year.

Transition to practice – How it is possible

It is possible to satisfy all requirements for board eligibility for neurosurgery within six post-graduate years. Those requirements include: 12 months of preliminary training (internship), 36 clinical neurosurgical months, 3 months of neurology, and 21 months to include neuroradiology, neuropathology, research, or other appropriate subject matter. Therefore, those programs which are approved for seven years of training can ensure that their trainees are “board eligible” by transitioning to a rotation schedule which moves the required rotations to the first six years. In essence, the chief residency year is moved from PGY-7 to PGY-6. Trainees who are “board eligible” meet all hospital and university requirements to function as “junior” faculty. This means that the seventh training year can be considerably more flexible than the current chief residency experience: these trainees can, if appropriate, take call, bill for services, run their own clinic, run their own operating room, and care for their own patients postoperatively. In other words, they can truly “have major or primary responsibility for patient management with faculty supervision.” We call this heavily mentored, semi-independent year “Transition to Practice.”

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Transition to practice – How it works

The TTP trainee takes call one week per month. A senior faculty member is always on “backup” call to provide consultation and assistance as necessary. The patients who are admitted emergently become the patients of the TTP trainee. In addition, the TTP trainee has a weekly outpatient clinic where he sees new patient referrals to the department who are not otherwise directed, by name, to senior faculty. The

individual has one dedicated OR day and access to other days as needed for emergent or urgent surgery. Senior faculty is available to assist the TTP with surgery. Thus, the TTP trainee develops a partly emergent, partly elective patient population for which he truly has “major or primary responsibility.”

The TTP year is primarily intended to be an educational experience, with service commitments proportional to the educational value received. In this regard, the TTP trainee is heavily mentored. Each trainee is assigned a senior faculty mentor who reviews all of the TTP’s cases on a weekly basis. The TTP may use other faculty as mentors if dictated by particular subspecialty expertise. In addition, the TTP presents all of his operative cases at a weekly departmental conference for detailed review and discussion. Finally, the TTP trainee keeps a detailed log of his patients, including operations performed, results, complications, and the specific faculty mentor’s name.

Transition to practice – Perceived benefits to training

1. The TTP schema does not increase the length of training. It shifts the Chief Resident year to PGY-6 and allows the PGY-7 to have substantially more responsibility for all aspects of patient care, with faculty mentoring.
2. The TTP trainee is able to bill independently for patient services. This income facilitates a higher salary for that year.
3. The TTP trainee is able to take faculty level call. This can be a win-win situation for the TTPs and the senior faculty. The TTP receives surgical patients while on call. The TTP has the opportunity to direct all aspects of patient care while on call. And the senior faculty call commitment is reduced to providing back up to the TTP.
4. The TTP trainee has the opportunity to run his/her own outpatient clinic without backup. As a junior faculty member he can meet patient expectations and bill for outpatient visits. Senior faculty is available for consultation.
5. Three trainees have completed a six-month TTP experience. They have had consistently busy surgical (6 month case numbers = 175) and clinic practices. When surveyed, all indicate a greatly increased level of confidence at the conclusion of the rotation. They rate the experience among the most educational in the neurosurgical training program. ■

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A Process to Meet the Challenge of Program Evaluation and Program Improvement

Daniel A. Knight, MD, Patricia M. Vannatta, MSPH, Patricia S. O’Sullivan, EdD

The “Common Program Requirements” of the Accreditation Council for Graduate Medical Education (ACGME) require systematic annual evaluation of the educational effectiveness of a program. Despite these instructions, review of the common citations listed on the ACGME web site indicated that programs are cited for the lack of systematic program evaluation. Residency program directors may lack resources, time and expertise to conduct program evaluations. Program evaluation and improvement requires a global look at all aspects of the residency program to examine what exists and what needs to change. Most residency programs have stacks of data that reflect various aspects of residency education. Programs may use the data thoughtfully, but primarily for information about the performance of individual residents rather than as an indicator of how well the program is doing. We will describe our approach to formative program evaluation. It guided the program in assessing the content and the quality of what it does. This allowed improvements in the program and preparation for the summative program evaluation through the accreditation process. The product of the internal approach is a program “report card,” which succinctly summarizes program progress on a regular basis.

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Program evaluation

The process described below is the result of evaluating our Family Medicine residency program using actual data, results and conclusions. The Residency Review Committee for Family Medicine (RRC-FM) sets a high standard for program evaluation while delineating its purpose and process. We critically examined what we were collecting and identified missing data relative to the program goals and objectives. We compiled the results in a new format – a residency program “report card.” To engage the faculty and residents we presented these results in a retreat where we challenged the participants to identify from this data how to improve the program.

Critical examination of the data collected

We grouped our evaluation instruments into four categories: curriculum, residents and graduates, faculty and resources. These corresponded to data needed to evaluate progress in achieving program goals and objectives. Guidance for these categories is based on the work of Kern and colleagues.¹ We matched all of the assessments used in our program to our program goals and objectives; as shown in **Table 1**.

We identified one gap. We lacked a formal mechanism for gathering the faculty members' perspective on the program. We designed a survey, "Program Evaluation Survey," to solicit anonymous perceptions from the faculty about the program. Residents also completed the same survey to augment their written evaluation of the program.

Constructing the Program Report Card

We needed a useable format to consolidate all of this data. The program report card compiled tabulated data from multiple sources collected to evaluate residents, faculty and the program. **Table 2** (the Program Report Card) indicates the categories, instruments, method of scoring, results, standards and comparisons to standards for the current year's performance. Data for the instruments were available at the

individual resident, faculty, didactic session, and rotation level. We averaged to provide summary statistics that described the residents, faculty, didactics, and rotations at a program level for each instrument.

We set "standards" by which we could indicate program quality. We chose standards that reflected either the norm for the instrument used or the explicit standards made in program expectations as set locally and by the accrediting organizations such as the American Board of Family Medicine (ABFM) and by the RRC-FM. For our institutional GME survey, we used the results for all residents and fellows on the campus as the norm. For local instruments we utilized the standard based on the scale on which the participants were responding (a five-point scale from "strongly disagree" to "strongly agree").

Some areas were challenging for setting standards. For example, the first standard for the program for resident clinical evaluation is that 100% of the residents will receive a "pass" for all items for all rotations. We also set that one-fourth of our residents would receive at least one honors evaluation as a measure of quality. We set standards for each level indicating the program expectation of progressively higher performance. Another challenge was in patient population. The RRC-FM requirements state that residents gain experience caring for

Table 1

Instruments/Sources Used to Evaluate Family Medicine Program

Curriculum	Faculty	Residents	Overall program resources
Rotation Evaluations	Evaluations of faculty by residents	Evaluation of Rotation Performance	GME survey*
GME survey	GME survey	Clinical Preceptor Evaluations	Monthly clinic census by resident
<i>Curriculum Committee minutes</i>	Faculty-resident Curricular and Program Evaluation survey	Didactic presentation skills	Resident OB continuity deliveries
Specific activity evaluations	Alumni Survey	360 degree evaluations	Resident OB rotation deliveries
<i>SWOT Analysis</i> †		Educational Plan	Patient population
In-training exam			ABFP Board Scores
<i>Resident Task Forces minutes</i>		<i>Videotaped Patient Encounters</i>	Resident Recruitment
Curricular Evaluation (survey)		<i>Research project</i>	Resident Retention
		<i>Procedures</i>	Alumni Survey
		<i>Journal Club Presentation</i>	

*GME survey : Graduate Medical Education survey that is administered at the institutional level

†SWOT: Strengths, Weaknesses, Opportunities, Threats

Note: italicized sources have not yet been incorporated into current program report card

Table 2

Program Report Card in Four Areas Indicating Performance and Standards

Area/Evaluation Instrument	Definition	Mean	Standard Deviation	Standard	Performance relative to standard
Curriculum (completed by residents unless otherwise noted)					
Rotation Evaluations	15 5-option items	3.94	0.50	4.0	Not met
Didactic Scores	4 5-option items for conferences	4.16	0.23	4.0	Met
Program Evaluation Survey: Curriculum rating by Faculty	Average of 11 7-option items by faculty	5.42	0.94	5.0	Met
Program Evaluation Survey: Curriculum rating by Resident	Average of 11 7-option items by residents	5.31	0.75	5.0	Met
GME Survey Academic Program score	Average of 12 5-option items	3.63	0.56	4.0	Not met
Resident "In-training" exam scores	Standardized test score	PGY-1 440 PGY-2 460 PGY-3 510		PGY-1 440 PGY-2 510 PGY-3 550	Met Not met Met
Faculty (completed by residents unless otherwise noted)					
Full-Time faculty	Average of 16 5-option items	4.59	0.18	4.5	Met
Part-Time faculty	Average of 16 5-option items	4.57	0.39	4.5	Met
GME Survey	Average of 6 5-option items	3.71	0.63	4.22	Not met
Program Survey: Faculty rating by Faculty	Average of 6 7-option items by faculty	6.31	0.58	5.0	Met
Program Survey: Faculty rating by Resident	Average of 6 7-option items by residents	5.69	0.70	5.0	Met
Residents (completed by faculty unless otherwise noted)					
Resident evaluation	Percent passing Percent receive at least one honors grade	100% pass 35.2%		100% pass 25% honors	Met Met
Preceptor evaluations	Average of 8 5-option items	PGY1: 3.48 PGY2: 3.82 PGY3: 4.45	0.32 0.15 0.27	3.50 4.00 4.50	Not met Not met Not met
Medical Student rating	Average of 19 5-option items	4.46	0.52	4.0	Met
Overall program resources					
Patient visits	Percent of patient visits as specified by the RRC	PGY1 124% PGY2 132% PGY3 70%		100%	Met Met Not met
FP OB – rotation FP OB - panel	Percent of PGY2s and 3s having 30 deliveries Percent of PGY 3s with 10 continuity deliveries	75% 100%		100% 100%	Not met Met
FP demographics	Percent of each age group represented in patient population seen	0–18 5% 19–35 22% 36–65 61% 65+ 13		10% pediatric	Not met
ABFP First Attempt Pass Rate	National licensing examination	89%		96%	Not met
Program Survey: Program rating by Faculty	Average of 8 7-option items	5.42	0.82	5.0	Met
Program Survey: Program rating by Resident	Average of 8 7-option items	5.30	1.00	5.0	Met
GME survey Overall item	Single 5-option item	3.12	0.49	3.74	Not met
GME survey recommend	Single 5-option item	3.18	1.13	3.86	Not met

pediatric, adult and geriatric patients. While there is no specified standard within the requirements, we have set a goal that 10% of our patient population would consist of pediatric patients. We made a decision to consider a standard met only if our point estimate (mean or percent) exceeded our standard. Our results were that in curriculum we met 62% of our standards; we met 75% of the standards for faculty, 75% for residents, and 45% for overall program resources. **Table 2** illustrates how all this information was summarized into a two-page report card.

Data from several sources are not yet included in the current report card. This includes resident performance in the ACGME competencies (includes individual standards for procedures, research progress, video-taped interactions, 360 degree evaluations), recruitment, resident retention, graduate survey, curriculum committee minutes and educational plan. This information would enhance the report card and will be addressed or incorporated in future developments and enhancements of the report card. The current format presents an assessment of the program that can be communicated to others.

“Our results were that in curriculum we met 62% of our standards; we met 75% of the standards for faculty, 75% for residents, and 45% for overall program resources.”

Program improvement

During a half day-long educational retreat, we shared the program report card with faculty and residents along with a more detailed presentation of the underlying assessments. We focused on the goals and objectives of the program, illustrating which data from the report card addressed which program goals and objectives. Retreat participants included all residency teaching faculty members, resident representatives from each year and one recent graduate. Participants formed three small groups. The Goals and Objectives Group used the “Program Report Card” to answer the questions: “Are the current goals appropriate or do they need to be revised?” The group determined that the goals and objectives were appropriate and that they needed small changes that were referred to the Residency Curriculum Committee. The Measures Group addressed the following question: “Does the data we measure tell us if we are meeting our goals?” The group recommended revising the rotational evaluation forms to reflect the ACGME general competencies and the GME Survey. They recognized that sample size bias in the current results require an improved return rate for evaluations. The Priority Group listed areas needing improvement and made recommendations for who should participate in bringing about the improvement.

Each group presented their deliberations to all retreat participants. Participants then developed action plans based on the recommendations of each group and specific assignments within a timeline were made. Finally, minutes of the meeting were distributed to all faculty and residents during the week following the retreat. Progress on the action plans will be reported periodically to faculty and residents. These efforts will be evaluated in the subsequent program evaluation.

Discussion

Based on our experience we recommend: 1) programs have program level goals and objectives; 2) they organize data around a framework; 3) they establish standards to judge what the data are telling; 4) they assemble faculty and residents to react to the report card and devise ways to improve the program. Because few standards for residency programs have been determined, it is essential that each program go through the process of setting standards. The areas falling below the set point are easily viewed and can be followed over time. As the program matures, it can readjust the standards as appropriate. The effort of developing a report card as part of the program evaluation forced the program faculty to clarify what the information that was collected really meant. By setting standards, the faculty was forced to decide how to use the results. This improved clarity will make future communication to residents and faculty members much easier.

While developing the report card, we identified aspects of our evaluation process that needed improvement. For example, some of our data were collected and summarized at irregular intervals. There were a low number of respondents for some types of evaluation. As with all program improvement processes, this review indicated not only areas for improvement within the actual residency program, but also areas for improvement in the program evaluation process.

Overall, developing the program report card as the instrument for our program evaluation gave us a useful summary of the current state of the residency program and allowed us to structure an effective program improvement effort. ■

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¹ Kern DE, Thomas PA, Howard D, Bass EB. Curriculum development for medical education: A six-step approach. Baltimore: The Johns Hopkins University Press, 1998:99-111.

Autonomy: Professional, Patient, Personal—Finding Balance

Deborah Powell, MD

For the past several years (prior to the Institute for Healthcare Improvement's National Quality Forum meeting) David C. Leach, MD, Executive Director of the ACGME has convened residency program directors and others in the academic community for an in-depth discussion of one of the ACGME's general competencies. These sessions have provoked a rich and thoughtful discussion. I have been fortunate enough to attend several. The meeting in December 2005 covered the competency of patient care. The first speaker of the morning was René Amalberti, MD, a psychiatrist and an expert on safe systems.

Dr. Amalberti commented that the health care system in the United States could be as safe as commercial aviation, but to accomplish this, the community would need to give up a considerable degree of physician and patient autonomy. He raised the question whether we would be willing, or able, to

“I considered how we select students for careers in medicine: focusing on those who throughout prior academic preparation have been goal-focused, self-achieving, and autonomous in their behavior as they move through a series of hurdles towards their goal of a career in medicine.”

do that. This statement made a profound impression on me. I could not stop thinking about those words. I considered how we select students for careers in medicine: focusing on those who throughout prior academic preparation have been goal-focused, self-achieving, and autonomous in their behavior as they move through a series of hurdles towards their goal of a career in medicine. And as I thought of the many things we would have to change in our medical education programs and health care settings in order to create an environment with less physician autonomy, I began to think, “I'm not sure we can do this.”

Later that day we heard Allison Clay's story. Allison Clay, MD, is a young physician, a faculty member, and a critical care specialist. She recounted the story of her recent personal experience with a health emergency and of the serious omissions and errors that occurred. All of us who listened were not only moved, but could easily understand how each event could have happened. But, the totality of those events was

overwhelming. So, after Allison's story, I concluded with the conviction that to make health care safer was simply not an option. I thought, “We must do this, we must find a way.”

How we start to address the issues of professional autonomy, patient autonomy, and personal autonomy from the standpoint of medical education is hard. And we cannot do it alone.

I would like to tell you a little about the institution where I now work. The University of Minnesota's Academic Health Center has six health professional schools: dentistry, medicine, nursing, pharmacy, public health (including a health administration program) and veterinary medicine. Three of the six deans are women – in medicine, nursing, and pharmacy – and three are men. The six deans have been selected by the same senior vice president and he and all the deans are passionately committed to the reality of inter-professional education and to the goal of facilitating the building of effective health care teams for the future through improved inter-professional education.

Even in this environment it is still hard for us to make the goal of inter-professional education work. I believe in part this is because we do not communicate well enough to our students and faculty that this is a core value. We do not emphasize why we feel it is important to achieve better health care for the future. So, I would like to tell you a story about an inter-professional student organization at the University of Minnesota called CLARION.

CLARION was started by three health professional students who were friends and wanted to understand more about what each other was learning in their specific educational programs. Over the years, it has grown to include students from the schools of medicine, nursing, public health, pharmacy, and health administration. The students meet monthly in informal and formal sessions. Every year the culminating event is the presentation of a clinical case study around a sentinel event which is presented by inter-professional teams of students to a panel of judges who include leaders in health care and insurance industries around the

“Every year the culminating event is the presentation of a clinical case study around a sentinel event which is presented by inter-professional teams of students to a panel of judges who include leaders in health care and insurance industries around the Twin Cities.”

“We as leaders and our faculty set the tone very early for professional identities and professional stereotypes which are very hard to overcome unless we actively take a role in changing this paradigm.”

Twin Cities. For most of the students this is purely voluntary and they spend considerable time and energy on these case presentations.

Shortly after arriving in Minnesota, I heard these students speak at a noon meeting to a group of residency program directors. They talked about CLARION and explained why they were engaged in this program. They also talked about what they learned from the faculty in their schools. I still remember the medical student saying, “When we arrive at medical school we are told from the very first day that we are the best, we are the brightest, and we are selected from a large group of applicants to be the leaders in health care.” She continued, “And I looked around the room and I wondered who these people are because I’m certainly not the best and the brightest and I wonder how I got into this class.” The nursing student said, “We are told from the time we enter nursing school that doctors believe that they know more than everyone else and that is our responsibility to work around them because they certainly don’t know everything.”

Other students said similar things, but I have never forgotten the impression that those students’ comments had made on me. We as leaders and our faculty set the tone very early for professional identities and professional stereotypes which are very hard to overcome unless we actively take a role in changing this paradigm.

Thus, I would like to put forward several pleas to all of us who are interested in better, safer health care and who are involved in medical education:

1. I believe that if we are truly to make our health care better, we must – all of us – begin to educate the next generation of health care professionals differently.
2. I believe that understanding of – and respect for – the knowledge and skills of other health professionals is learned early and best by shared learning experiences among health professional students.
3. I believe that we have a huge influence on the kind of practitioners our students become and to do it right we must change not only what we do, but how we do it. We must give up or suspend many of our traditional ideas. We must influence our faculty colleagues to do the same.

A lot of what we call professional autonomy is about power and hierarchy. But what we need more than ever in healthcare are effective professional teams. We don’t need more hierarchical power. Several years ago I heard a talk given by Carol Aschenbrener, MD, now the Vice President for Education at the Association of American Medical Colleges. She talked about two types of power – power over and power to. Power over is about control and authority. Power to is about empowering others, to facilitate opportunities and ultimately to enable change to occur. To succeed in what we must do to transform our health professions educational systems, we have to understand that for us the important power – the only meaningful power – is the power to:

- The power to change the way our students learn and practice
- The power to change our attitudes
- The power to create true interdisciplinary learning and, from that, true interdisciplinary respect.

It is not easy, but it is necessary and none of us can do it alone.

“Power over is about control and authority. Power to is about empowering others, to facilitate opportunities and ultimately to enable change to occur.”

Our mission and our values – personal and institutional – must overtly state this. Our students must see us model it. Only then will we truly begin to achieve the high quality, safe health care we all desire. ■

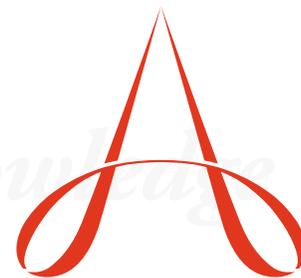
Deborah Powell, MD, is the Dean of the University of Minnesota Medical School, Minneapolis, Minnesota, and a member of the ACGME’s Board of Directors.

CALL FOR ABSTRACTS

2007 ACGME ANNUAL EDUCATIONAL CONFERENCE

March 2-4, 2007

The Marvin R. Dunn Poster Session



ACGME

“Reinventing the Learning Environment”

The Accreditation Council for Graduate Medical Education (ACGME) invites abstracts for poster presentations at its annual conference March 2–4, 2007 at the Gaylord Palms Resort and Convention Center in Kissimmee, Florida. Program directors, faculty, administrators and residents interested or involved in graduate medical education are encouraged to submit abstracts.

SUGGESTED TOPICS FOR SUBMISSION

The ACGME welcomes posters that report on successful initiatives to improve graduate medical education related to: 1) teaching and assessing the general competencies (with a special interest in the use of portfolios); 2) using assessment results to drive and guide program improvement; 3) changing the learning environment or redesigning education and patient care (with a special interest in measurable improvements in patient safety, patient care outcomes, resident educational outcomes); and 4) implementing strategies and methods, including faculty development, to facilitate educational improvement at the institutional or program level.

NEW THIS YEAR!

All abstracts accepted for poster presentation will be considered for a special recognition award and featured as oral presentations. Criteria for recognition as an oral presentation are the following:

- Objectives: substantive; clearly stated
- Content: aligned with stated objectives
- Methods: clear description of how the project was conducted and/or implemented; project design sound and appropriate
- Results/Outcomes/Improvements: described clearly
- Relevance: how the project adds to or extends current practice
- Significance: implications of project beyond local setting

SUBMISSION PROCESS

Abstracts must be received electronically by January 8, 2007 (abstracts@acgme.org). Notification of acceptance for poster presentation will be e-mailed by **January 15, 2007**. Notification of special recognition awards and oral presentations will be e-mailed **January 29, 2007**. All poster presenters will be required to prepare a poster for the session and be available from 5:30 pm–7:30 pm on the evening of Friday, March 2, 2007 to discuss the poster. Recipients of special recognition awards will also be required to present a 10-minute oral description of their work in an oral presentation session on Friday, March 2, 2007 3:15 pm–4:45 pm.

ALL PRESENTERS ARE REQUIRED TO REGISTER FOR THE WORKSHOP.

FORMATTING INSTRUCTIONS

Abstracts must be submitted as a single-page document typed in Microsoft Word or Word Perfect format. Margins should be 1-inch on all sides. **DO NOT** use abbreviations in the abstract title. The abstract title should be typed in ALL CAPS. The title should be brief, but clearly indicate the nature of the project or investigation.

The author(s) name(s) and institutional affiliation(s) should be typed in Title Case (upper and lower letters) on the line after the title. The abstract must be sent to abstracts@acgme.org as an e-mail attachment. The sender of the abstract should be the lead author. All communication will occur with the lead author. Questions regarding the abstracts should also be sent to this electronic address.

NOTE: Simple graphs or tables may be included if they fit on the single page. The text of the abstract must be organized into the sections below (use headings in bold):

1. **Purpose** of investigation or project
2. **Methodology**, including investigation or project design and analysis
3. **Summary of results** (if applicable)
4. **Conclusions**

Abstract Checklist:

1. The abstract must be typed in 10-pt or 12-pt Arial or Times Roman font style; margins must be 1-inch on all sides.
2. The title should be typed in ALL CAPS.
3. Content of abstract should be single-spaced with double-space only between title and author's names.
4. The abstract must not exceed 300 words and must fit on a single page. Not more than three references may be included. If references are used, they must still fit on the single page.

SUBMISSION DEADLINE AND NOTIFICATION

All submissions must be received at the ACGME office no later than **January 15, 2007**. Submissions must be sent electronically according to the format outlined above. No substitutions will be accepted. Authors will receive confirmation of their submission upon its receipt in the ACGME office. The first author will be notified by **January 29, 2007** whether the submission has been accepted for poster or oral presentation. Display specifications and communication guidelines will be provided at the time of acceptance.

Abstracts submitted to other national meetings are acceptable provided they have not been accepted for publication in a peer-reviewed journal prior to the meeting date.

Please note that the ACGME does not endorse any commercial medical education products, and therefore will not accept abstracts promoting the use of these products.

MedEdPORTAL: A Resource Across the Medical Education Continuum

Kathryn M. Andolsek, MD, MPH, Chris Candler MD

MedEdPORTAL, (Providing Online Resources To Advance Learning in Medical Education at www.aamc.org/mededportal) is the American Association of Medical Colleges' compendium of peer reviewed educational resources. It is designed to support education across the continuum from undergraduate to continuing medical education. It includes animation, assessment instruments, team learning, faculty development materials and over 100 "virtual patients" representing a broad spectrum of disciplines and institutions. In its first year nearly 300 items were submitted from 90 US and Canadian medical schools. It is "cost effective," conserving faculty talent and budgets by decreasing the need to duplicate materials similar to those already available. It encourages active collaboration to allow ready access to other individuals and institutions working on similar topics and strategies.

Users identify and access materials through keyword and more complex searches. Many of these are free or available at a nominal charge. They can be used "off the shelf" or easily customized to one's own program. Items are organized by "discipline," by "hot topic," and by the type of tool (e.g. the "virtual patient").

MedEdPORTAL's rigorous peer review process serves a dual function. Users can be confident that posted resources have been validated as high quality. But probably just as importantly, it provides a critically important venue to recognize educational scholarship. It acknowledges innovative formats of teaching such as CD ROMs, DVDs, tutorials, and web based resources as legitimate and suitable products to support promotion and tenure decisions which are on par with traditional print publications in peer reviewed journals. MedEdPORTAL supports faculty in changing the academic culture at their institution. Faculty can use tools to self assess their material prior to publication. They also can use MedEdPORTAL to submit their materials electronically for consideration, obtain feedback from reviewers, and identify who has accessed their resources.

To ensure that it serves a broad community in a meaningful way, MedEdPORTAL utilizes the Glassick Criteria for scholarship.¹ Accepted resources must demonstrate the following:

- Clear goals
- Adequate preparation
- Utilization of appropriate methods with a sound educational approach
- Significant results
- Effective presentation
- Reflective critique

MedEdPORTAL is structured as a traditional print journal having an editor and editorial board, maintaining a peer review policy, following a rigorous process and using invited expert reviewers. Successful "products" are referenced by using a unique identification number by which their work may be cited in both NLM and APA format. Accepted works may also display the MedEdPORTAL Peer Reviewed Logo, considered a special mark of distinction indicating high quality. Original copyrights are not transferred and remain with their owners. Rights to disseminate the work are provided with a usage license.

During a one month period in 2006, 122 US and Canadian medical schools and 43 teaching hospitals and international schools used the site. There were 2208 items accessed. One third of the searches were for virtual patients.

"Successful "products" are referenced by using a unique identification number by which their work may be cited in both NLM and APA format."

The online submission process is easy and MedEdPORTAL's support team readily available to assist with the process. The site helps to disseminate new curricula, including the Duke University's free curriculum on resident impairment and fatigue (www.lifecurriculum.info) enhancing the usage, impact, and sustainability that the foundation which funded this project challenges the user to achieve. Like Supercourse, The University of Pittsburgh's global repository of lectures on public health and prevention, MedEdPORTAL unites a community of educators who relish an innovative environment.

MedEdPORTAL can be accessed at www.aamc.org/mededportal to meeting programs' curricular needs. Participants also may submit their own educational "products," or they may volunteer to serve as a reviewer. MedEdPORTAL needs reviewers in General Surgery, Emergency Medicine, Obstetrics, Gynecology, Neurology, Physiology and the basic sciences. Programs and academic promotion and tenure committees should be aware of this resource and its legitimacy. ■

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¹ Glassick CE Huber MR Macroff GI. Scholarship Assessed: Evaluation of the Professoriate. 1997. San Francisco, CA: Jossey-Bass

A New Elective Rotation in Patient Safety at the Medical College of Wisconsin Affiliated Hospitals

Barbara A. Connelly, RN, MEd, CPHRM,
Mahendr S. Kochar, MD, MS, MBA, MACP

Since the publication of the Institute of Medicine's report *To Err is Human* in 2000,¹ health care delivery systems are attempting to address medical errors and patient injury. This work, generally referred to as efforts to promote patient safety, is multi-dimensional and aimed at improving patient care and outcomes through changing the culture of health care and how care is delivered. Since today's residents will shape how tomorrow's health care is delivered, graduate medical education and future medical practice will be strengthened by giving residents and fellows the opportunity to enhance their understanding of patient safety and quality improvement.

The Medical College of Wisconsin Affiliated Hospitals (MCWAH) considered several approaches to focus on patient safety education and decided that one approach at the institutional level can be an elective rotation in Patient Safety and Quality Improvement that is broad-based, encompassing most current aspects of patient safety work. Three factors make this approach attractive for MCWAH's GME programs:

- When reviewing the breadth of patient safety work it became clear that the patient safety rotation uniquely meets all the Accreditation Council for Graduate Medical Education (ACGME) competencies.
- The Medical College of Wisconsin has many faculty members actively involved in patient safety at both the local and national level, who are eager to include patient safety in their residency curricula.
- Several MCWAH hospitals are engaged in cutting-edge patient safety work, which creates a rich environment for observation and experience for residents participating in the rotation.

Goals and objectives

The goal of the MCWAH patient safety rotation is to prepare residents for a physician leadership role in improving the safety and quality of safe health care in complex organizations. The rotation is designed to give residents an in-depth exposure to patient safety and quality improvement through self-study, observation and completion of a project.

Upon completion of this elective rotation residents should be able to:

1. Articulate how physicians bring about change to improve patient care and outcomes.
2. Be proficient in the background, scope and meaning of patient safety work.
3. Demonstrate leadership skills by leading or actively participating on a team working on quality improvement or patient safety activities.
4. Detail how adverse events and patient injuries can be avoided or minimized through practice changes.
5. Show how quality improvement and risk identification tools can be used to effect change within the patient care environment by incorporating them into their project.
6. Identify the principles and attributes of systems, along with human factor engineering and technology and discuss how they can be used to improve the safe delivery of health care.
7. Demonstrate the application of patient safety and quality improvement theories and tools in the completion of a project.

“Demonstrate leadership skills by leading or actively participating on a team working on quality improvement or patient safety activities.”

Rotation description

The elective rotation is available to all MCWAH residents and fellows who have completed at least one year in their program and who have the approval of their program director and the Executive Director of MCWAH. The rotation centers on a core curriculum that consists of five modules:

- Module 1 – Background and Overview of Patient Safety in Health Care
- Module 2 – Quality and Patient Safety Tools
- Module 3 – Physician Leadership in Patient Safety
- Module 4 – Systems, Human Factor Engineering and Technology
- Module 5 – Safe Clinical Practice

During the month-long rotation the resident will complete all self-study modules in the core curriculum and participate in discussions about patient safety. He/she chooses a faculty advisor for the rotation who evaluates performance during the rotation. This mentor and the program director monitor and

evaluate the quality improvement project the resident undertakes. In addition to selecting an advisor, residents select a faculty member as a content expert for each of the five modules. The faculty experts guide the residents' learning and assess their understanding of each module. They also submit an assessment to the resident's advisor.

Observation and participation are major components of the rotation. Residents spend time observing patient safety and quality improvement activities by shadowing patient safety and quality leaders at the various affiliated hospitals. Experience will be shaped by the available opportunities, but will include attending quality council meetings, patient safety meetings, root cause analysis or failure mode effect analysis work sessions, six sigma project meetings, and hospital training on patient safety goals and initiatives.

With the assistance or approval of the program director, the resident selects a patient safety or other improvement project that is relevant to clinical practice. The timeline for completing the project is approved by the advisor. The rotation requires submission of a written report that describes the project and its outcome. The resident may fulfill this requirement by participating in an active project at MCWAH facility with the concurrence of the program director and advisor. The resident must also present the project at a conference in his/her residency or fellowship program.

Evaluation

The resident will be evaluated by their faculty experts, advisor and program director. The project initiated during the rotation must be completed before he or she receives the final evaluation for the rotation. Projects are evaluated by the program director and the residents' advisor. As this is a new rotation, MCWAH will seek, and heavily weigh, evaluations from residents and faculty participants during the early months this elective is offered. ■

Barbara Connelly, RN, MJ, CPHRM, is the Risk Manager at the Medical College of Wisconsin Affiliated Hospitals (MCWAH). Mahendr S. Kochar, MD, MS, MBA, MACP is the DIO and Executive Director, MCWAH. MACP stands for Master of the American College of Physicians; it is conferred based on peer review.

¹ Corrigan, Janet M.; Donaldson, Molla S.; and Kohn, Linda T.; eds., *To Err is Human: Building a Safer Health Care System*. Committee on Quality of Health Care in America, Institute of Medicine. National Academy Press, Washington, D.C., 2000.

Teaching the Teachers of Patient Safety: A Progress Report

John Gosbee, MD, Linda Williams, RN, MS, Ed Dunn, MD

“I thought the conference was helpful for *learning about the field of human factors engineering* and for what a large depth and breadth of resources about patient safety...”

“I already started to count some errors that we do or see. ...this meeting did change our way of thinking and *now I approach things in the hospital differently.*”

The Department of Veterans Affairs (VA) National Center for Patient Safety (NCPS) provides tools, policies, and implementation support for patient safety activities within the more than 160 VA federal health care facilities. With its partners, the VA continues to develop, test, and implement a patient safety curriculum for medical residents and students and associated faculty development. In 2002, the authors began to teach and involve residents

“Attendees, mainly physician faculty and patient safety officers, have used the training materials with residents in lectures, case conferences, teaching rounds, and special projects.”

and faculty physicians. As the curriculum was pilot tested, a pressing need for faculty development and a more extensive teaching tool kit emerged. As the timeline outlines, curriculum workshops and toolkits were developed and improved. Measurement of outcomes has been a feature of the program since 2003.

Since the first two articles in the **ACGME Bulletin** describing this effort,^{1,2} twelve national and regional faculty development workshops have taken place in 11 sites, including two at the ACGME's Annual Educational Conference. The 430 attendees have come from over 60 VA hospitals and 40 university affiliates. Attendees, mainly physician faculty and patient safety officers, have used the training materials with residents in lectures, case conferences, teaching rounds, and special projects. Early evaluation of the program, using process and outcome measures, has been positive, including self reports during the monthly teleconferences and via informal e-mails. The driving force for innovation and dissemination is represented by the physician teachers and patient safety managers within the VA and affiliated universities. Their pioneering work continues to effectively change the mindset of residents to move us toward a “culture of safety” for VA health care and beyond.

Timeline of the Patient Safety Curriculum Project

1994 - 1999	Gosbee develops and teaches core patient safety and human factors engineering modules for Michigan State University residents and students
July - Dec 2002	The VA pilots tests the modules. Several physicians and patient safety managers at VA institutions and affiliated universities use and teach the patient safety modules on a volunteer basis
April 2003	A symposium for volunteer teachers and other stakeholders addresses lessons learned, assessment data, new modules, and next steps
May - Dec 2003	NCPS pilot tests faculty development approaches; volunteers and NCPS test and refine new modules and formats
Jan 2004	NCPS holds teleconferences and meetings to develop curriculum workshop
March 2004	Pilot test of curriculum workshop with 40 attendees from 25 VAs and universities
July 2004 - May 2006	Twelve workshops at 11 sites with 430 attendees (details below)

Since March 2004, the VA National Center for Patient Safety has conducted and continuously improved workshops for faculty development aimed at personnel who would have a role in teaching patient safety to residents. In the US, more than half of residents do at least part of their training at VA hospitals.⁴ Because residents are at the frontlines of care, they can identify and propose solutions to patient safety issues. Yet efforts to enhance safety are inherently inter-professional; therefore, while we target faculty of residency programs, the invitation to participate extends beyond physician-teachers and program directors, to include other health professions, patient safety officers and hospital management.

From the first, the central goal of the project has been to *build a solid foundation for understanding the systems approach to patient safety*. To achieve this, we have positioned the principles and tools of human factors engineering as the foundation of patient safety. This is comparable to using microbiology as the foundation for infection control. The more fully articulated goals and objectives have only changed slightly in the past two years. They include:

Goals

1. Residents are active agents of change towards systems and quality approach; away from “blame and train” model;
2. Residents incorporate understanding of human performance and high reliability organizations into patient care and patient safety activities; and
3. VA facilities help affiliated residency programs provide good education.

Objectives

1. Understand the scope and gravity of patient safety and adverse events;
2. Know theoretical and practical reasons why “blame and train” approaches fail;
3. Become familiar with the basics of safety and human factors engineering;
4. Learn and apply key tools for “diagnosing” root causes;
5. Learn and apply human factors engineering techniques to the design of effective interventions; and
6. Understand how to apply the new mindset to the systems of care they work within and their practice of medicine.

There have been 430 participants at 13 workshops in three types of venues. The following are key aspects of these workshops:

Location and sponsor

- Eight workshops (2004 - 2006) were held in eight cities, sponsored by the VA Employee Education System, which processes accreditation for Category 1 CME, manages registration, and contracts with the sites.
- Two workshops were presented by invitation of VA medical centers and their university affiliates: the Columbia (SC) VA and the University of South Carolina; and the West Haven (CT) VA and Yale University
- Three workshops have been presented at professional society meetings: two at the ACGME Educational Conference and one at a meeting of the Society of General Internal Medicine (SGIM).

Attendees

- 350 attendees have primary affiliation with 60 VA medical centers and/or 40 universities affiliated with VA (there are approximately 100 VAs with university affiliates)
- Attendance is not restricted to VA medical centers and their university affiliates; non-affiliated programs and other government entities (Department of Defense) have also sent participants.
- Patient safety managers, pharmacists, nurses, information technologists, and others who are key to promoting patient safety have participated.
- A total of 31 medical specialties were represented, with internal medicine (35%) and surgery (10%) constituting the largest groups.
- Attendees have had a wide variety of job titles, including academic (professor, associate dean) and physician managers such chiefs of staff, and have hailed from 42 states and six foreign nations.

Continuous improvement of the workshops

The workshop agenda and content have been continuously improved to accomplish the objectives and respond to immediate and delayed feedback by participants. The workshops have been presented in a variety of settings with a variety of participants, and for varying lengths of time. The content and methods have been customized to audience, time, and place. These changes are evident when the agenda for the early 2004 workshops is compared with that for 2006. Changes were made based on feedback from participants, observed responses during workshops, and data from pre- and post-workshop surveys.

Comparing the two agendas

Selected changes included increasing the time devoted to root cause analysis, and a shift in focus from teaching a general understanding of how an RCA is conducted, to teaching and practicing two RCA tools, cause and effect diagramming and

compliance with rules of causation. The literature supports these two key components as crucial to finding root causes. In addition, guest faculty from either VAMC or university affiliated program now present success stories of resident participation on real RCA teams. This emphasizes the concept that residents should be allowed to experience the RCA process with patient safety experts rather than being lectured about the process.

Human factors engineering has remained at the heart of the curriculum. Learning about usability testing continues to be a hands-on experience. In addition, 30 to 60 minutes have been dedicated to strategies for establishing trust. Legal and ethical issues of patient safety are now being included in the introduction (Patient Safety Fundamentals) and scattered in appropriate places throughout the sessions. Teaching evidence-based interventions to enhance safety has been given increased time and importance, and attendees now practice applying an evidence-based framework to cases involving medical device and architecture. Patient Safety Case Conference is one

March 2004 Agenda

Day 1

Hours	Session or module	Hours	Session or module
1.25	General overview of patient safety curriculum	0.5	Background and Overview
1.0	Patient Safety Introduction: 5 - 6 modular subsections for introducing and engaging learners	1.0	Patient Safety Fundamentals – Concepts and Tools
0.5	Small group discussion	1.0	RCA: Resident Participation and Overview
1.0	Human Factors Engineering and Patient Safety (core principles)	1.0	RCA Key Tools – C/E Diagram, 5 Principles of Causation
0.5	Small group discussion	1.5	Human Factors Engineering
1.5	Root Cause Analysis (RCA)	0.5	Swift and Long-Term Trust
1.25	Patient Safety Interventions (evidence-based) and alternative teaching frameworks (modifying RCA into M&M; Morning Report, etc)	3.0	Patient Safety Interventions (evidence-based)
1.0	Posters and hands-on exhibits, discussion, reception		

Day 2

Hours	Session or module	Hours	Session or module
1.25	Patient Safety Focused Case Conferences (discussion of tools, tips, expansion on alternative teaching frameworks that have been used effectively)	1.25	Integrating Patient Safety into Existing Education Formats
0.5	Establishing Swift and Long Term Trust (Instructor preparation for teaching patient safety)	2.0	Case conference
0.5	Integrating Patient Safety Modulettes into Teaching Rounds (Oxygen-Medical Air wall outlet confusion; MR safety of “sand” bags, etc)	1.0	Dramatic Simulation
1.0	Small group discussion to tackle one major topic each	1.0	Selling and Assessing Patient Safety Curriculum
0.5	Small groups report; session evaluation	2.25	Teaching plan development and review
		0.5	De-briefing assessment

of the most requested additions to the curriculum. It was changed from a 15-minute mention and group exercise with one case to a two-hour session. Use of hands-on human factors engineering exhibits now is part of teaching exercises throughout the workshop, rather than browsed through during a reception.⁵ Finally, ideas for selling the inclusion of patient safety in the resident curriculum and methods for assessing learning by residents were added and take-home tools provided.

Selected changes in approach

Changes not evident if looking only at the first agenda and the most recent are those things that were tested and rejected. For awhile we wanted to include some discussion of adult learning principles, but found that this wandered too far from the heart of our concern for teaching patient safety. It seems to be enough to demonstrate those principles as we conduct the workshops. The goal is to use very few slides, and to stop frequently for individual or small group work. After the 2005 ACGME educational conference, we added a workbook and incorporated the handout version of slides for those who wish to be able to connect what they viewed on slides with notes they take.

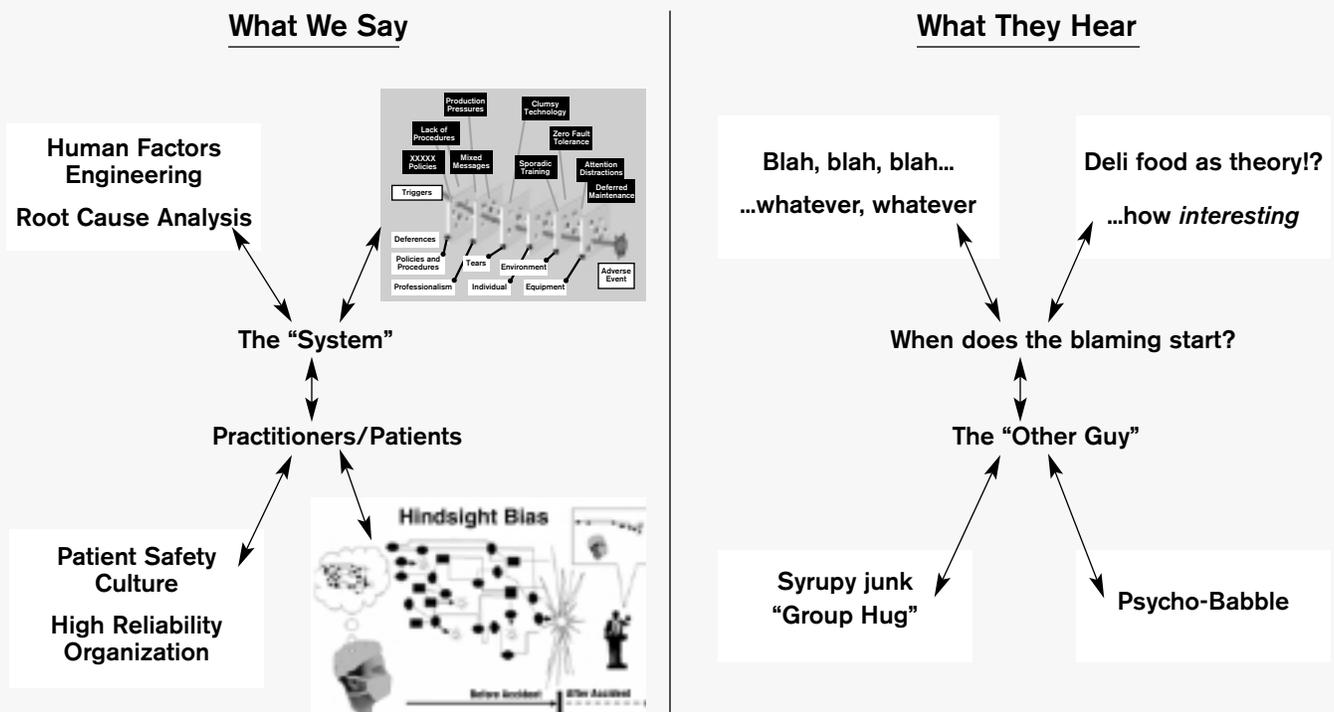
Requests for modular curriculum material have come from individuals who teach in a variety of settings and for varying amounts of time. In analyzing this trend, several questions arise:

- How does one decide what to teach given that the location and participants are predetermined?
- What is revealed by what is selected as essential when a full two day workshop is not an option?; and
- What information about patient safety is essential for taking action that allows individuals and organizations to prevent harm to patients?

Case Conference: The current format for the case conference section involves three stages. The first is for NCPS faculty to role play being the audience. They use the case conference to guide their questions and analysis of root causes and posing potential patient safety solutions. The objectives of role play are to more clearly demonstrate application of principles of causation, human factors engineering, and choosing interventions that are intermediate or strong. In the second stage, a workshop attendee facilitates discussion and discovery of root causes and potential interventions, while faculty offer critique of the facilitation and the audience's line of questioning and problem solving. In the third stage, each small group of 5-6 performs a mock patient safety case conference using the tools and getting feedback from a facilitator at each table.

Root Cause Analysis: The Literature shows that the "hard-wiring" of humans predisposes them to fail at conducting a good root cause analysis.⁶ A more valuable activity is to practice two key methods that enable humans to get at causes: cause and effect diagrams and rules of causation. Since their inclusion in the workshops, participants' ability to sink their

Figure 1
Barriers to Learning



teeth into root cause analysis, case conferences, and other solution-finding exercises has increased. A related goal is to emphasize residents as valuable members of real RCA teams, where they can participate with other patient safety experts in a process that will result in real system change. To that end, current workshops include presentations by residents who have experience on RCA teams or by patient safety managers who recruit residents to serve on these teams.

What we say; what they hear

One of the barriers to learning to teach patient safety is the vocabulary that rapidly becomes familiar to teachers. For those new to the topics of patient safety and human factors engineering the introductory sections are described as overwhelming and the pace as too fast. (Figure 1)

The answer to both questions (how best to convey what is essential without resorting to use of specialty jargon) seems to lie in using interactive teaching methods so that concepts are taught even if the human factors engineering term for the concept isn't assimilated into the participant's vocabulary.

Hands-on exhibits

Hands-on learning is an interactive method that has value at several points in the workshop. At the first workshop, we displayed items with a short explanation. Now we use displays to enable participants to see the application to the systems within which they work.

Human factors engineering will remain at the heart of the curriculum. Usability testing continues to be a hands-on experience. The most recent workshops have included an opportunity to develop usability testing for medical devices. At a recent workshop, Chief Residents used exhibits to practice presenting patient safety work-rounds.

The collection of hands-on exhibits illustrates how design issues contribute to adverse events and close calls. The goal is to demonstrate both problem designs and innovative, excellent design with the understanding that we know a lot about how humans function physiologically and cognitively.

Planning document

When participants use the workbook and follow through to include ideas in the planning document, the final session of the workshop is partly completed before it begins. The NCPS faculty remains to provide additional success stories and provoke creative thinking.

Outcomes and results

Six months after the workshop, participants responding to a survey using the workshop material, either in the original form or in combination with their own. The following represents the topics taught, in order of frequency reported by workshop participants:

1. Introduction to Patient Safety
2. Root Cause Analysis
3. Human Factors Engineering

4. Patient Safety Case Conference
5. Evidence-based Patient Safety Interventions
6. Dramatic Simulation
7. Swift and Long Term Trust
8. Selling (Promoting) Inclusion of Patient Safety in Resident Curriculum
9. Healthcare Failure Mode and Effect Analysis
10. Teaching Rounds

Preliminary results from a statistical analysis suggest that sending one or more physician teachers to a faculty development workshop predicts that residents at those sites are much more likely be members of a root cause analysis (RCA) team. One goal of the curriculum is to have residents learn AND participate in patient safety activities, including being a member of a RCA team. The same analysis also suggest that sending more than three physician teachers increases the chances of RCA participation at that site 3-fold over sites that send no one to the workshop. Final analysis and publication is expected in early 2007.

Conclusions and next steps

With its non-federal partners, the VA National Center for Patient Safety continues to develop, test, and implement patient safety curriculum and faculty development for medical residents and students. The national and regional faculty development workshops with over 430 attendees, 60 VA hospitals, and 40 university affiliates have inspired many to use our training materials with residents. We have improved the workshops, innovated at the teleconference sessions, and expanded the teaching tools. The driving force continues to be the physician teachers and patient safety managers doing the work on the "front lines." The VA NCPS will continue to offer national and regional training workshops through the VA education system (February and April 2007), in partnership with the Alliance of Internal Medicine (Fall 2006) and at the ACGME Educational Conference in Kissimmee (March 2007). ■

John Gosbee, MD, Linda Williams, RN and Edward Dunn, MD are staff at the VA National Center for Patient Safety, Ann Arbor, MI.

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On-Demand High Fidelity Neurosurgical Procedure Simulator Prototype at University of Illinois using Virtual Reality and Haptics

P. Pat Banerjee, PhD and Fady T. Charbel, MD

According to David C. Leach, MD, Executive Director of ACGME, simulation will be part of the redesign of graduate medical education.¹ Hence it is important to understand the technical underpinnings of simulation, because they may directly affect decisions to invest in simulation. One of the most advanced concepts in high-fidelity simulators is the use of virtual reality. The ability to develop patient-specific situations on-demand is a key goal of virtual reality-based, high-fidelity simulators. Given the enormous variation in human anatomy and the substantial investment in building a simulation facility, the on-demand approach is likely to prevent a simulator from rapid obsolescence.

At the University of Illinois at Chicago (UIC) a new generation of virtual reality and haptic-based simulation device prototypes is being built by combining the institution's strengths in engineering and medicine. The focus of this article is on the virtual reality and haptic technologies impacting high fidelity simulators.

In 1992 a room sized, four-walled, projection-based 3-dimensional virtual reality system known as CAVE (Coordinated Automatic Virtual Environment) was invented at UIC.² Over the past decade the popular CAVE technology has undergone a number of enhancements to overcome its comparatively low resolution graphics, which resulted in low visual acuity and lack of brightness. Only the most recent manifestation of the CAVE this year at Iowa State University³ has the technological capability for developing life sized, high-fidelity 3-dimensional virtual reality mannequins. Its more than \$4 million price tag makes the technology out of reach for simulators in the foreseeable future.

Since 1994 there has been a parallel effort underway at UIC, known as ImmersaDesk, to develop more cost effective large desktop displays. The latest manifestation is known as ImmersaDesk4 is built from two Apple 30" 2560 x 1600 LCD panels mounted with quarter-wave plates in front of the panels to achieve circular polarization. The panels are bisected by a half-silvered mirror which reverses the polarization of the top LCD panel. An optional 3D position and orientation tracking system can be attached to allow the computer graphics to project the correct viewer-centered stereoscopic imagery based on the user's head position and orientation.

Starting from the late 1990s UIC has embarked on an ambitious effort to integrate virtual reality and haptics in a meaningful way. The latest device, known as ImmersiveTouch, has been quite successful in developing on-demand high fidelity simulations. It represents the first system that integrates a haptic device with a head and hand tracking system and a high resolution high pixel-density stereoscopic display. It offers a remarkable visual acuity of 20/24 which is quite close to a perfect 20/20 vision. The name ImmersiveTouch signifies a combination of 3D "immersive" virtual reality and a feeling of "touching" virtual objects brought about by the force feedback from a robotic stylus. The on-demand virtual anatomical volumes can be created from real patient images such as magnetic resonance imaging (MRI), computed tomography (CT) or a stereo image. The unique features include a dynamically collocated virtual reality, a haptic (or touch) workspace, a high resolution display and head tracking.

The high-performance, multi-sensory computer interface allows easy development of on-demand virtual reality simulations that appeal to many stimuli: audio, visual, tactile and kinesthetic. ImmersiveTouch is built using many standard off-the-shelf hardware and open source software components, making it an open platform for on-demand simulations. The hardware integrates 3D stereo visualization, force feedback, head and hand tracking, and spatialized 3D audio. The software provides a unified Applications Programming Interface to handle graphics and haptics rendering, 3D audio feedback, interactive menus and buttons.

A demonstration of an on-demand high fidelity neurosurgical procedural simulation of a ventriculostomy using ImmersiveTouch shows its added capabilities. Ventriculostomy is a neurosurgical procedure that consists of the insertion of a catheter into the ventricles of the brain to relieve intracranial pressure. A distinct "popping" sensation is felt as the catheter enters the ventricles. Early low fidelity ventriculostomy simulators provided some basic audio/visual feedback to simulate the procedure, displaying a 3D virtual model of a human head. Without any tactile feedback, the usefulness of such simulators was very limited. The first generation haptic ventriculostomy simulators incorporated a haptic device to generate a virtual resistance and "give" upon ventricular entry. Haptic feedback offers simulated resistance and relaxation with passage of a virtual 3D ventriculostomy catheter through the brain parenchyma into the ventricle. While this created considerable excitement as a novelty device for cannulating ventricles, its usefulness for teaching and measuring neurosurgical expertise was still very limited.

Lack of crucial high fidelity features led to poor collocation between the haptic device stylus held by the surgeon and the visual representation of the virtual catheter, as well as the lack of a correct viewer-centered perspective. The ImmersiveTouch second generation haptic

ventriculostomy simulator overcomes these limitations by introducing a head and hand tracking system and high-resolution high visual acuity stereoscopic display to enhance the perception and realism of the virtual ventriculostomy.

A study recently submitted for publication compares the performance of 78 neurosurgical fellows and residents for accuracy of ventriculostomy catheter placement on a CT patient data set using ImmersiveTouch to that of a recent retrospective evaluation study done at University of Missouri Hospital performed on the head CT scans of 97 patients who underwent 98 free-hand pass ventriculostomy placements in an ICU setting. The average distance of the catheter tip to the foramen of Monro and the standard deviation were almost identical.

“The ideal simulator is flexible enough to handle a variety of clinical situations and its building blocks are reusable.”

Other neurosurgical techniques such as vascular aneurysm clippings are currently being developed. In addition to the use of the ImmersiveTouch simulator in the neurosurgical simulation context described in this article, a cataract surgery simulator is being developed with the UIC Ophthalmology. Eventually a proposed UIC Institute of Patient Safety Excellence will house many of these simulation devices.

In conclusion, the goal of on-demand high fidelity virtual reality and haptically enabled simulations leads to three major advantages: 1) flexibility, 2) reusability and 3) telemedicine compatibility. The ideal simulator is flexible enough to handle a variety of clinical situations and its building blocks are reusable. Since the simulator operates in the virtual reality and haptic domain, its contents can be transmitted and downloaded through the internet, thereby promoting telemedicine capabilities. ■

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¹ ACGME Bulletin, December 2005 (entire issue devoted to Simulation)

² Cruz–Neira, C., Sandin, D.J., DeFanti, T.A., Kenyon, R.V. and Hart, J.C. (1992). “The CAVE: Audio Visual Experience Automatic Virtual Environment”, Communications of the ACM, 35(6), pp. 65–72

³ <http://www.iastate.edu/~nscenral/news/2006/may/c6update.shtml>, accessed August 14, 2006.

Review Committee Column

The name of this column, formerly titled RRC/IRC Column, was changed to reflect the ACGME’s use of the term “Review Committee” for all RRCs and the IRC.

ACGME recognizes new subspecialties of Hospice and Palliative Care and Transplant Hepatology

The ACGME approved Hospice and Palliative Care as a new accredited subspecialty, and subspecialty program requirements for the new subspecialty. As many as eleven specialties may offer education in Hospice and Palliative Care Medicine, and there was concern about who will prove subspecialty expertise to the relevant residency review committees. Plans call for the American Board of Medical Specialties to offer a certifying exam for this subspecialty.

In a presentation to the ACGME Executive Committee, Russell Portenoy, MD, Chair of the Ad Hoc Committee for Hospice and Palliative Care Medicine, emphasized the need for inclusiveness across the many specialties that have need for subspecialty competence in Hospice and Palliative Care Medicine. He also commented on the need for innovative models that would allow education for individuals who choose to practice Hospice and Palliative Care Medicine in mid-career.

The ACGME also approved subspecialty accreditation and new subspecialty program requirements for Transplant Hepatology, as a subspecialty of Internal Medicine, effective June 27, 2006.

ACGME approves addendum to Internal Medicine and Pediatrics Program Requirements to allow accreditation of combined programs

The ACGME approved an Addendum to the Program Requirements for Internal Medicine and Pediatrics, to facilitate the accreditation of combined Internal Medicine–Pediatrics residency programs, effective June 27, 2006.

Unlike the prior unaccredited programs, which functioned as “tracks” in accredited internal medicine and pediatrics programs, the new accredited Internal Medicine–Pediatrics programs must be provided by core programs in these specialties that are accredited by ACGME. The curriculum for the combined program must comply with the ACGME requirements for the two specialties, with modifications to accommodate overlapping experiences in both disciplines. In addition, the combined program must function as an integral part of the accredited core program in each of the two specialties, while preserving the integrity of these core programs, and residents in the core and the combined programs must interact at all levels of training.

In the coming months, existing combined Internal Medicine–Pediatrics programs will be invited to submit an application for accreditation. More detailed information about the application process will be published on the ACGME’s web site.

ACGME approves revisions to the Program Requirements for pediatric subspecialties

The ACGME approved the Program Requirements for the Subspecialties of Pediatrics. The new Program Requirements for Adolescent Medicine will become effective January 1, 2007. The Program Requirements for the remaining subspecialties of Pediatrics will become effective July 1, 2007.

ACGME discontinues accreditation of Sports Medicine as a subspecialty of Internal Medicine

At the request of the Review Committee for Internal Medicine, the ACGME discontinued accreditation of the Sports Medicine as a subspecialty of Internal Medicine, effective June 30, 2006. Accredited training in Sports Medicine for adults will continue to be offered through the Residency Review Committee for Family Medicine, and new programs may apply through that specialty.

Appointments to the Transitional Year Review Committee

The ACGME confirmed two new members of the Transitional Year Review committee: David Kuo, MD, Director, Transitional Year Residency, Overlook Hospital, Summit, NJ, and Robert Bing-You, MD, Associate Vice President for Medical Education, Maine Medical Center, and reappointed Ronald Zagoria, MD, Professor of Radiology, Wake Forest University School of Medicine.

Other News from the ACGME

ACGME approves disaster plan

The Board of Directors approved the ACGME Disaster Preparedness Plan, which formalized policies and procedures for natural and other disasters that result in disruption to patient care and resident education in institutions that sponsor and/or participate in resident education. Among other elements of disaster preparedness and response, the plan emphasizes the importance of inter-organizational communication to assist in the temporary relocation of residents if core patient care and education functions at the sponsoring institution are disrupted by a disaster.

Strategic Initiatives Committee focuses on patient-centered care

At its June 2006 meeting, the Strategic Initiatives Committee explored patient-centered care as a property of the systems in which residents learn and work, and how the ACGME and JCAHO could partner to enhance focus on patient-centeredness as an attribute of the settings and systems in which residents learn and participate in care. ■

Inter-professional Conflict and Medical Errors

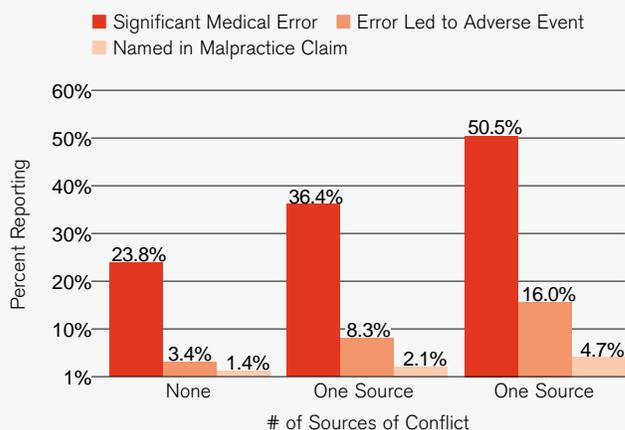
DeWitt C. Baldwin, Jr., MD, Steven R. Daugherty, PhD

Inter-professional conflict has been assumed to play an important role in medical errors. However, there has been little supporting empirical evidence. In 1999, we surveyed a random sample of 6,106 first- and second-year residents regarding their residency experience. The response rate was 64.2% (N=3,604). Three questions asked about "serious conflict" with another professional staff member, and additional questions asked residents whether they had made a "significant medical error" during their current year of training, and whether this had resulted in an adverse patient outcome.

"More than a quarter (27.1%) of respondents (n=958) also reported having made a "significant medical error" during the year, and 5% reported that this resulted in an adverse patient outcome."

Just over 20% (n=722) of responding residents reported having personally experienced "serious conflict" with another staff member. For 50% this involved another resident, for 41% an attending physician, and for 44% a member of the nursing staff. More than a quarter (27.1%) of respondents (n=958) also reported having made a "significant medical error" during the year, and 5% reported that this resulted in an adverse patient outcome. Compared to the 2,811 residents who reported no inter-professional conflict, a higher percentage of residents who reported conflict also reported making a medical error, with an increasing percentage of them resulting in adverse outcomes, shown in **Figure 1**.

Figure 1
Inter-professional Conflict, Errors & Adverse outcomes



“Conflict with an attending physician had the greatest association with medical error, with 46.6% of respondents who reported this type of conflict also reporting a medical error.”

The type of health professional involved in the inter-professional conflict appears to affect the relationship with medical error, as shown in **Table 1**. Conflict with an attending physician had the greatest association with medical error, with 46.6% of respondents who reported this type of conflict also reporting a medical error.

In summary, conflict and medical errors are positively related, and are associated with decreased satisfaction with learning and reduced overall satisfaction with the residency experience, as well as with higher ratings of personal stress. The association between this type of conflict and medical errors merits further investigation. ■

DeWitt C. Baldwin, Jr., MD, is scholar in residence at the Accreditation Council for Graduate Medical Education, Steven R. Daugherty, PhD, is an assistant professor in psychology and preventive medicine at Rush Medical College, Chicago.

Table 1
Nature of Inter-Professional conflict and Medical Errors

Nature of Conflict	Reported: Significant Error	Adverse Outcome
Conflict with another resident	41.9%	12.4%
Conflict with attending	46.6%	12.1%
Conflict with nursing staff	40.3%	11%

FSMB sponsors Summit on Medical Practice

The Federation of State Medical Boards (FSMB) sponsored the third in a series of summits to explore the attributes of good medical care. The meeting, held in Philadelphia in June 2006 brought together representatives from 34 organizations including professional groups, providers and regulatory and accrediting organizations. Participants sought answers to the question, “How does the healthcare community determine, measure, and assure the public concerning physician competence over the entire career of the physician?”

During the first Summit in March 2005 participants had developed scenarios for the health care system in the coming 15 to 20 years. The second summit, held in December 2005 produced a draft statement of physician competence. At the third summit, participants discussed the development of a national alliance for physician competence and a document specifying the attributes of “Good Medical Practice” as a starting point for broader conversations. A fourth summit is planned for late 2006 or early 2007. ■

“Delivering Patient Safety” in the United Kingdom

“...health care could be a hundred times safer than it is today.”
Dr Donald Berwick, IHI

Delivering Patient Safety is a comprehensive, ready-to-use series that aggregates the thoughts of safety experts and medical professionals on approaches to identify and address health care error. It is intended for clinicians, surgical teams, nursing staff, pharmacists, managers, ancillary staff and others with responsibilities for patient safety. The series consists of five DVDs and associated learning materials, a Human Factors Manual and strategies for using the series. Introduced by eminent expert James Reason, PhD, the series was developed in consultation with the UK Health Care Commission and National Patient Safety Agency and the Institute for Health Care Improvement (IHI).

While it is intended for hospitals in the United Kingdom, and uses UK practitioners, settings and examples, a number of the contributors come from the United States including Lucian Leape, MD, Harvard School of Public Health; Donald Berwick, MD, CEO, IHI, and Dr. Roger Resar, Mayo Health Systems. The format uses expert opinion combined with clinical scenes, to convey the central message that error can happen to any practitioner, and that addressing it requires the attention to individual and systems factors that create vulnerabilities. For more information, visit <http://www.deliveringpatientsafety.com/>. ■

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