

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

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A "Design Conference" As A Way to Broaden Input into the Redesign of The Learning Environment

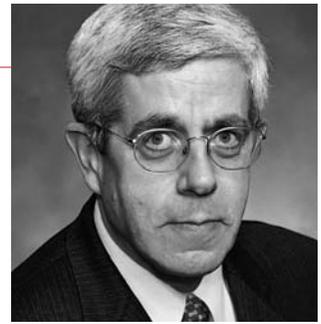
In 2006, as part of the celebration of its 25th Anniversary, the ACGME held its first design conference on the learning environment. The impetus was interest in exploring what kind of changes in the learning environment are needed, and what would be useful and feasible for programs and institutions. The idea for the conference also came from an understanding that the process of "from the ground up" redesign of the learning environment benefits from a dialogue with the resident education community. The aim was to bring together stakeholders of the resident education and accreditation process, and engage them in dialogue that would lead to concrete ideas for how improve the learning environment for residents and fellows.

The collaborative design conference was held September 2006 in Rosemont, Illinois. It brought together 170 program directors, DIOs, faculty members, Review Committee members, ACGME staff and interested others. Participants spent two and one-half days listening to presentations, interspaced with structured design sessions that aggregated their ideas about the optimal learning environment for the future. The conference concluded with a session that allowed participants to evaluate the design ideas developed by their peers.

The conference was designed to meet these objectives:

- Use creativity and collaboration to increase clinical efficiency and quality in settings where residents learn;
- Apply the key themes of innovation in education;
- Advance resident education through application of the six general competencies; and
- Through attendee evaluation and consensus, select a few pragmatic interventions with a high likelihood of success in immediate improvement in the learning environment.

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The Case for Redesign of GME

David C. Leach, MD

"...hope represents man's authentic response to the reality of that part of his existence which has not yet come into being."¹

Participants heard invited key note presentations on themes relevant to the residency redesign. These included a lecture by Hubert Dreyfus, PhD, Emeritus Professor of Philosophy, University of California at Berkeley, who spoke about the Dreyfus model of adult acquisition of a skill. Emily Patterson, PhD from the Institute for Ergonomics, Ohio State University, summarized lessons from industrial engineering that can be applied to the learning environment; Tina Foster, MD, MPH, MS, described the Preventive Medicine Leadership Residency at Dartmouth-Hitchcock Medical Center as a pragmatic model for structuring learning and clinical care; and Elliott Fisher, MD, MPH, Director of Health Policy Research at the Center for Evaluative Clinical Sciences, Dartmouth Medical School, summarized his research on the relationship between health care spending and patient care and educational outcomes. The presentations were

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interspersed with design sessions that harnessed attendees' creativity in a collaborative, facilitated setting. The result is a set of concrete recommendations for how to improve the setting for physician education, and how to plan for excellence and innovation in tomorrow's learning environment.

The ideas, synopses of the presenters' remarks, and practical information on the forces facilitating and hindering innovation in the learning environment make up this special issue of the Bulletin. This is prefaced by an article by David Leach, MD, that makes the case for the need to redesign the settings in which residents learn. ACGME envisions this issue of the Bulletin as the first in a series that seeks to illuminate the redesign of the learning environment. ■

The news continues to be grim. At a recent ABMS/ACGME symposium Beth McGlynn reported that when elements of quality care are bundled only 2.5% of patients are getting all of care that they need.² For each individual element the rate is about 53%. This on top of a growing population of uninsured or underinsured, endless reports of medical error, wide variability in care that has no scientific basis, growth in costs (now at 14.9% of GDP, 50% percent of the world's health care costs are incurred in the United States to serve 5% of the world's population). The Wall Street Journal reports that 50,000 patients this year could not find affordable care in the United States and so went to India to have their major surgery at a fraction of the costs. Yet inner city hospitals are closing and no longer able to sustain seeing hoards of patients with no way of paying for care. All this is occurring at a time when biomedical science and technology have brought our capacity to actually help people to an all time high.

What does this have to do with residency and with accreditation of residency programs in particular? I can think of three reasons ACGME should be involved.

First, it may be that we are actually making the problem worse. Accreditation tends to be a trailing edge phenomenon. Our standards reflect behaviors that are well established and thought to be helpful, yet they may in fact inhibit changes in

"Our standards reflect behaviors that are well established and thought to be helpful, yet they may in fact inhibit changes in behavior or structure needed for redesign of the system."

behavior or structure needed for redesign of the system. We must first do no harm. The Committee on Innovation in the Learning Environment is encouraging new approaches and is actively building a community of practice around redesign of GME and the environments that support good learning and good patient care.

Second, once redesign is sought residents are a tremendous resource; they have knowledge and a deep desire to help. How often do we hear residents say, "It's really weird how they do things around here." Residents live in the cracks

of the system; they know in great detail what is broken and frequently have ideas about how it could be fixed.

Third, the current system provides a wonderful substrate to enable residents to become competent in System-Based Practice, one of the ACGME competencies. The expectation that residents will be able to diagnose and treat systems of care just as they diagnose and treat patients is made very real by the failure of the current system. It's comparable to starting in the ICU – they will need the help of faculty and others. This is a huge task. Hope requires an “authentic response” to both the current reality and that part of reality that is only now emerging as our future.

What can we use to guide us? I suggest the following:

1. Begin with patient-centered care as the end in mind.

Good doctors and good learning have as their purpose the improvement of patient care. Talent and energy is attracted by this ancient and noble purpose. Under the leadership of Mark Laret, CEO of UCSF, ACGME's Strategic Initiatives Committee has spent the last two meetings trying to clarify how ACGME should organize its efforts in ways that foster and enable patient-centered care. Although our overriding purpose has been to improve patient care we in fact are quite “profession-centric.” Carol Cronin has reviewed models of patient-centered care.³ Residents are already engaged in many aspects of the model: patient education and shared knowledge; involvement of families; respect

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for patients’ needs and free access to information for example. This is what residents do, however, it may not be framed as their core job, rather something that is only done when the nurse says: “Nineteen A's family wants to talk with you.” The public television series “Remaking American Medicine” highlighted the Medical College of Georgia as an example of true patient-centered care. It's quite different from most hospitals – what would it take to change the entire system in ways that made us really proud of how patients are treated?

2. System redesign happens incrementally and is not a solo sport. For 28 years I lived in Detroit and therefore am willing to bring in a non-medical example of system improvement. So far this year Ford and General Motors have laid off 46,000 employees and closed 26 North American factories.⁴ Toyota has never closed a North American factory and is opening two more in 2008. How do they do it? Some quotes from the

Fishman article: “It restructures a little bit of work every shift.” “...improvements are not ‘projects’ or ‘initiatives’; they are the work...every day, every week.”⁵ One of the managers describes his early days at Toyota in ways reminiscent of a resident's morning report. “Every Friday, there was a senior staff meeting. ...I gave a report of an activity we'd been doing and I spoke very positively about it, I bragged a little.” His boss, Fujio Cho, who later became worldwide chairman of Toyota said: “We all know that you are a good manager but please talk to us about your problems so we can all work on them together.” Residents may feel pressure to present a coherent story with a successful outcome. What if they instead were encouraged to focus on the system problems that didn't go so well so that we all could work on them together?

3. Transparency. Some hospitals are beginning to put clinical outcomes – good and bad – on their web sites. This is so much better than the usual “best doctors, best technology, and best care” approach offered by many hospital public relations experts. The profession has to take back the communication portfolio – we have to tell the truth always. We have to tell it in ways that the public can understand. Failure to recognize and communicate bad news quashes improvement.

4. We need to learn a new vocabulary. At ACGME's recent Design Conference, reported on in this issue of the Bulletin, one of the speakers was an industrial engineer. She made it clear that industrial engineers and physicians speak different languages and yet she also said: “Industrial engineers want to help.” She demonstrated technology that, for the most part, was unfamiliar to the audience of physicians but that made the processes of work and the current situation visible and available for action. We will have to form new partnerships with those from other professions and as an act of respect learn some of their language and integrate it with our work.

There are other possible guides; I'm sure you have thought of several already. It is apparent that focusing on the individual physician won't get us out of the fix described above. We need to raise the level of accountability for our organizations and ourselves as a profession. Good learning and good patient care have to dance. The audience is waiting. ■

¹ Pieper, Josef. Josef Pieper: An Anthology, Ignatius Press, San Francisco 1984, p. 207.

² McGlynn, Beth Evaluating Physician Performance, Effectiveness and Efficiency Metrics. ABMS/ACGME Symposium November 3, 2006, Chicago, Illinois.

³ Cronin, C. Patient-centered care: an overview of definitions and concepts. Prepared for the National Health Council; February 10, 2004.

⁴ Fishman, Charles. No Satisfaction. Fast Company, Issue 111, December, 2006, page 82.

⁵ Ibid.

2007 John C. Gienapp Award Address: Inviting the Grace of the Great Thing

Paul B. Batalden, MD

Thank you, for the connection that this recognition makes to the leadership of the work of the ACGME. It matters a lot to me to be connected to the leadership of this place and its special work. A friend to many here tonight, Parker Palmer and I first met in Nashville about 20 years ago. He has given me many gifts of insight and reflection. In fact, I suppose that some would say that some of these “gifts” have achieved the status of something of a curse – I sometimes have trouble getting them out of my head. I want to talk a little more about one of those gifts very briefly: the idea of “The Grace of Great Things.”

Just a little over 100 years ago, in 1905, the great European poet and writer, Rainer Marie Rilke was a young man and struggling to re-locate his writer’s edge. He took up work as a secretary to the sculptor, François Auguste Rodin. Rodin was a master of the creative process. He told Rilke that if he was to regain his creative edge, he should go and explore the grace of the great thing he wanted to write about before he tried to write.

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As Rilke thought about Rodin’s advice, he began to notice this principle at work in Rodin himself. Rilke saw the way that Rodin sought the grace of great things.

- Rilke wrote that Rodin had a certain conscientiousness of execution...[making himself] familiar with every part [of the thing he was trying to represent], [hiding] nothing, [overlooking] nothing, nowhere [using] deceit, [knowing] all the hundred profiles, [becoming] familiar with every angle, from above, from below.

“It is at the ACGME where I have been invited to notice the grace of a great thing – people in residence becoming clinical specialist doctors from their earlier accomplishments as medical students.”

- Rilke noted that for Rodin, his work...had to be carried out so humbly, so obediently, so devotedly, so impartially...permeated by a spirit of obedience [to the truth of the thing]...returning constantly to question...
- Rilke wrote that [Rodin] had an intensity of interest...a concentrated gaze which [came and went] like the light of a lighthouse.

As Rilke took it all in and began to follow Rodin’s counsel, he started to write again. Soon he published his famous collection of “New Poems,” a collection of poems about “seeing” or noticing. This noticing of the “grace of a great thing” in the midst of a learning space is what Parker Palmer invites teachers to seek. Now let me try to connect this idea with this place – the ACGME and its work. It is at the ACGME where I have been invited to notice the grace of a great thing – people in residence becoming clinical specialist doctors from their earlier accomplishments as medical students.

As we contemplate the grace of that great thing, what are we invited to notice? Let me suggest just a few:

- First, by careful watching and listening to these learning people we can discern the practical wisdom-in-development as these learners meet particular people and address their particular needs.
- Being around them one gets the importance of time – the longitudinal, chronologic time – like 80 hours – and the vertical, interrupting time that signals the breakthroughs in understanding and meaning that come.
- You can’t miss the engagement and absorption that comes in the midst of these learner’s lives as they process and deal with the knowledge that another person’s life may be at stake in their work.
- They show the joy and fear that accompany the search for getting it right as they explore the gaps between the limits of their technical professional knowledge and the reality of the patient in front of them.
- They sometimes perceive themselves as interim and under-recognized glue for the inadequate and sometimes broken surroundings of systems that are so complicated and so complex that they seem to defy improvement and safe functioning.

- As you watch intently, you notice the love that underpins their care for other human beings in need...and what that does to them – the learners – as they try to recognize the attachments that might disable them.
- Their curiosity that is made manifest in their attempts to limit the burden of illness while they practice linking the science of disease biology with the science of clinical practice.
- Around them you see those interested in their professional formation: the communities of teachers and schedulers and administrators always trying to balance learning intent with the moment available.
- In this work you see the keeping and the keepers of what is good and noble in this profession – sometimes appreciated, sometimes not.
- You can't miss the hard work and the sweaty reality of it all. After all, people who are sick and worried are not at the top of their game and they are trying to put a civil face on it all – for themselves and with these learners.

Into this great thing, we invite promising young people to immerse themselves.

“First, by careful watching and listening to these learning people we can discern the practical wisdom-in-development as these learners meet particular people and address their particular needs.”

What has been so special for me about my work with this great thing and this place, the ACGME, has been the reflective invitation to consider the *grace* of this great thing. This invitation has come in so many ways reminiscent of Rilke's observations about Rodin:

- The encouragement to focus with integrity on what really matters in health professional formation and health care.
- The creativity and diversity of viewpoints of so many volunteers.
- The hard work of so many in the processes of the ACGME to be fair.
- The willingness of so many to change their long-established ways...and to help others do the same.

- The desire of nearly everyone to pay close attention to the voices of residents and to the patients.
- The insight of your leaders and the energy of the staff...and it goes on and on as we look around and begin to notice with fresh eyes.

“...the people who have come together in the past and for those who have yet to come together around the ACGME and its work collectively hold a thread...and that thread is connected to the grace of the formation of tomorrow's physicians, a great thing.

When we recognize the grace of this great thing of health professional formation and its relentless inherent desire to improve itself, we can also recognize its inextricable linkage to better patient outcome and better system performance – with everyone in the act...they all work together – professional development, patient outcome and system performance – in a sustaining and generative interdependency.

As I bring these few comments to a close, let me note another gift from Parker Palmer: his introduction for me to the poetry of William Stafford. Many here are familiar with Stafford's suggestion in the poem, *The Way It Is*, that each of us holds a thread as we go through our lives. Many things change, but it doesn't change. Holding this thread helps us make sense and meaning and purpose in the midst of what we face from day to day.

Let me end by suggesting that the people who have come together in the past and for those who have yet to come together around the ACGME and its work collectively hold a thread...and that thread is connected to the grace of the formation of tomorrow's physicians, a great thing. For all who will benefit from good – and even better – health care and for all of us, our children and our grandchildren, I hope that we never let go of this thread. ■

2006 Design Conference on the Learning Environment Keynote address From Novice to Expert

Hubert Dreyfuss, PhD

“To preserve expertise, we must foster intuition at the highest levels of decision making, otherwise wisdom will become an endangered species of knowledge.” – Hubert Dreyfuss

The Dreyfus model of adult acquisition of skills (Exhibit 1) has been of interest in understanding learning in medicine and other health professions. In most domains of adult learning, the progression from novice to expert begins with the instructor decomposing the task into context-free features that novices can recognize. Beginners are given rules that specify action in response to particular features. This does not require skill or expertise. However, because merely following the rules will produce poor performance, learners need not only the facts but an understanding of the context in which that information makes sense. Beginners lack that sense.

Exhibit 1

The Dreyfus Model of Skill Acquisition

Novice – Rule based, context free

Advanced Beginner – situational aspects

Competent – Able to devise plan, decide what is important

Proficient – Intuitive behavior replaces reasoned responses

Expert – subtle discriminations, immediate intuitive response

Master – *loves surprises*

Dr. Dreyfus noted that as beginners gain experience with real situations, they start to see meaningful aspects of a situation. The learning environment should include near-peer teaching with the teacher acting as coach, pointing out the relevant aspects and demonstrating what to do when they are present. But with added experience, the number of potentially relevant elements and procedures that learners can recognize becomes overwhelming. Since a sense of what is important in a particular situation is missing, performance is exhausting, and the student may wonder how anybody ever masters the skill. Learners must learn to restrict themselves to a few possibly

relevant features and aspects, which makes understanding and decision-making easier but may result in actions that are not optimal to the given situation.

Competent performers seek rules and reasoning procedures to decide which perspective to adopt. But such rules are not as easy to come by as those given beginners. There are more situations than can be named or precisely defined, and no one can prepare a list of situations and what to look for in each. Students must decide for themselves what plan or perspective to adopt without being sure that it will turn

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out to be appropriate. Given this uncertainty, coping becomes frightening rather than just exhausting. Until now, if the rules do not work, learners are able to rationalize that they have not been given adequate rules. Now they feel responsible for their actions which often lead to confusion and failure. But when things work out, the competent student experiences a kind of elation unknown to the beginner.

As a competent student becomes emotionally involved in a task, it becomes increasingly difficult for him or her to draw back and adopt the detached maxim-following stance of the advanced beginner. At this point, the environment should support and promote involvement, taking risks, and taking responsibility for what happens. The teacher should be an exemplar of how to do this.

“To become competent you have to regret your mistakes.” – Hubert Dreyfus

Emotional involvement may be seen as interfering with detached rule testing, but just the opposite seems to be the case. In nursing, Patricia Benner studied each stage of skill acquisition, finding that unless learners stay emotionally involved and accept the joy of a job well done and the remorse of mistakes, they will not develop further, and will eventually burn out trying to keep track of all the features and aspects, rules and maxims that modern medicine requires. In the cases of nurses at least, resistance to involvement and risk leads to stagnation and ultimately to boredom and regression.¹ Generally, seeking the safety of rules one will not get beyond competence, while the true goal is expertise. Experiencing deeply felt rewards or remorse seems to be necessary for the performer to learn from examples without rules. The role of emotional involvement grows as the individual learns

a skill. The beginner's job is to follow the rules and gain experience. Only at the level of competence is there an emotional investment in the *choice of the perspective* leading to an action. Then emotional involvement seems to play an essential role in switching over from what one might roughly think of as a left-hemisphere analytic approach to a right-hemisphere holistic one.

Not just any emotional reaction such as enthusiasm, or fear of making a fool of oneself, or the exultation of victory, will do. What matters is taking responsibility for successful and unsuccessful choices, even brooding over them and replaying one's performance in one's mind step by step or move by move. The point is not mainly to analyze one's mistakes and insights and come up with better rules, but to *let one's mistakes sink in*. Experience shows that only then will one become an expert. After becoming an expert, one can stop this kind of obsessing, but if one is to become a master, one has to go on dwelling emotionally on what critical choices one has made and how they affected the outcome.

“Proficiency seems to develop if, and only if, experience is assimilated in this embodied, non-theoretical way.”

As the competent performer becomes more and more emotionally involved in his task, it becomes increasingly difficult to adopt the detached rule-following stance of the beginner. When this is replaced by involvement and the learner accepts the anxiety of choice, he or she is set for further skill advancement. The resulting positive and negative emotional experiences will strengthen successful perspectives and the performer's theory of a skill represented by rules and principles will gradually be replaced by situational discriminations. Proficiency seems to develop if, and only if, experience is assimilated in this embodied, non-theoretical way.

Many instances of apparently complex problem solving that seem to implement a long-range strategy, as, for example, a masterful move in chess, are best understood as direct responses to familiar perceptual gestalts. After years of seeing chess games unfold, by responding to familiar types of patterns on the chess board a chess grandmaster can play master level chess while his deliberate, analytic mind is absorbed in something else.² Such play, based as it is on previous attention to hundreds of thousands of actual and book moves, incorporates a tradition that determines the appropriate response to a situation and makes possible long range, strategic, purposive play, without the player needing to be conscious of any plan or goal at all.

At this stage the involved, experienced performer

sees goals and salient aspects, but not what to do to achieve these goals. This is inevitable since there are far fewer ways of seeing what is going on than there are ways of reacting. Proficient performers have not yet had enough experience with the outcomes of a wide variety of possible responses to each situation they can now discriminate, to react immediately. Thus, the proficient performer, after spontaneously seeing the issue and the important aspects of the current situation, must still *decide* what to do. And to decide, he must fall back on detached rule and maxim following.

The proficient chess player, who is classed a master, can recognize almost immediately a large repertoire of types of positions. But she needs to deliberate to determine which move will best achieve her goal. The teacher should be an expert and learning should be case-based learning. The learner needs to be involved in the case and needs to be required to sort through irrelevant information in order to learn to trust his or her intuition concerning what is relevant. *Proficient performers* see what needs to be done, but must *decide* how to do it. *Experts* see what needs to be achieved and thanks to their larger repertoire of situational discriminations also see immediately how to achieve their goal. The ability to make more subtle and refined discriminations is what distinguishes the expert from the proficient performer. With enough experience in a variety of situations, the brain of the expert gradually decomposes each class of situations into subclasses, each of which requires a specific response. This allows the immediate intuitive situational response that is characteristic of expertise.

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In the Dreyfus model, anyone who consistently makes successful intuitive responses to specific situations counts as an expert. This may seem counterintuitive. For example, most people, in California at least, would count as expert drivers. We here are probably all expert typists. As expert typists we don't follow the rules we once learned; we position our fingers so we can take a short cut to the next key. Even bureaucrats, who deal with the same issues for years, become experts in

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their domains. All this suggests that the average person is an expert in many domains. Indeed, in any domain, if the learner stays emotionally involved and has enough experience, he will become an expert who responds intuitively to the current situation.

As long as the situations stay stable such expertise does not require constant learning. One can be expert at responding intuitively to each unique situation, while nonetheless doing the standard thing. But such experts lack a broad and deep understanding of their domain. This broader and subtler sensitivity can only be learned by a more intense involvement than that found in the expert – a kind of involvement that keeps one learning more and more even after one has acquired expertise. While most experts become satisfied with a given level of success, and stop responding emotionally to each new experience, a few people, at least in areas important to them, are never satisfied that they have done the right thing, even if public approval assures them it was right. Such people sense that there is no one right thing to do and that they can always improve. They are so involved in their skill domain that they brood over their failures and delight in their successes.

“Masters are never satisfied with their current level of knowledge; they are always trying to do it better.”

If such learners dwell on their successes and failures, replaying them over and over in their mind, they will reach a new level of skillful coping beyond expertise. Let us call it *Mastery*.³ Just as the beginner can go on to become aware not just of context free features but also of meaningful situational aspects, the expert can progress from responding immediately to *specific situations* to responding immediately to the *whole meaningful context*. The *constantly concerned master* develops a grasp of the whole unfolding activity – a grasp that the *complacent expert* cannot achieve.

The expert carpenter building a cabinet can be counted upon to put the wood together in the accepted way and hit the nails appropriately for the kind of wood he is using. The master craftsman, sometimes call a *Zen carpenter*, however, is responsive to the specific grain of the wood and to the whole situation, both architectural, domestic, and social, into which his work is to fit.⁴ To become a master of course one always

“Mastery involves “Learning the internal goods... “ Masters know the point of being a doctor.”

needs more practice of the sort that makes one an expert both in the theory and the skill of treating the ill, but more importantly one needs to be apprenticed to a master who exhibits life-long learning and a grasp of the broadest context because he or she has a sense of what is at stake in the practice of medicine – what it means to be a doctor. ■

Hubert L. Dreyfus, is professor of philosophy in the Graduate School at the University of California at Berkeley.

- ¹ Patricia Benner has described this phenomenon in *From Novice to Expert: Excellence and Power in Clinical Nursing Practice*, Addison-Wesley, 1984, 164.
- ² For a full discussion of the chess example, see H. Dreyfus and S. Dreyfus, *Mind over Machine*, New York: The Free Press, 1988.
- ³ As long as we don't think of the master as having everything under control, but, rather, as being maximally open and responsive to the whole situation.
- ⁴ Heidegger points out that “[A] true cabinetmaker...makes himself answer and respond above all to the different kinds of wood and to the shapes slumbering within that wood – to wood as it enters into man's dwelling with all the hidden riches of its nature.” Martin Heidegger, *Discourse on Thinking*, trans. John Anderson and E. Hans Freund, New York: Harper & Row, 1959, p. 50. Heidegger presents the same story with more details in his account of the “four causes” involved in the making of a silver chalice. Martin Heidegger, “The Question Concerning Technology,” in *The Question Concerning Technology and Other Essays*, trans. William Lovitt (New York: Harper & Row, 1977)

Proceedings from the First ACGME Design Conference on the Learning Environment ~ *Ingrid Philibert*

Constituents and the Redesign of the Learning Environment: The Process

Involving constituents and users in design is growing across a wide range of products, from automobiles to small consumer items. In health care, consumer and end-user involvement in the design of the health care environment, and design and usability testing of technology and devices used in patient care does not yet represent the norm, but is gaining prominence. Benefits include designers having an enhanced understanding of constituent needs and wants and how they interface with what is being designed. It results in product and systems that are more accepted and successful.¹ In health care, reported benefits include increased safety, user-friendliness and patient-centeredness.²

In September 2006, the ACGME hosted a design conference to engage a group of constituents in thinking about the redesign of the learning environment. The context included an emerging sense that the learning environment

“Benefits include designers having an enhanced understanding of constituent needs and wants and how they interface with what is being designed, and product and systems that are more accepted and successful.”

needs to be redesigned. This includes feedback from constituents indicating that the ACGME’s roll-out of the six general competencies in 2002 and the common duty hour standards in 2003 presented challenges in many settings, despite the acknowledged benefits of both initiatives. The challenges arose in part because the traditional paradigm of resident education has not easily adapted to the largely concurrent implementation of two major changes in the education and accreditation approach. Efforts to make minor adjustments or to force current educational and patient care practices to accommodate to these new initiatives have not uniformly met with success.

The 2006 ACGME design conference on the learning environment constituted an initial test of a new approach to graduate medical education accreditation. The aims were three-fold. The first was to explore the benefits of involving constituents in the re-design of the learning environment, and

“The second aim was to facilitate a broad dialogue about the aspects of the learning environment that could benefit from innovation and improvement.”

whether this would result in new designs that met their needs and expectations. The second aim was to facilitate a broad dialogue about the aspects of the learning environment that could benefit from innovation and improvement. The Committee on Innovation in the Learning Environment and the ACGME plans to use the results of the conference in its efforts, including work to identify, evaluate and publicize “notable practices,” beginning with the publication of proceedings in this issue of the ACGME Bulletin. The third aim was to explore the accreditation implications of redesign in the learning environment, and to seek the perspective of participants on the role the ACGME should play in the coming years to facilitate innovation and improvement to the learning environment.

Six Design Topics

The conference interspaced lectures, such as the talk by Dr. Dreyfus, with design sessions during which attendees developed initial ideas into concrete proposals. The discussions and the design sessions were organized around six attributes of an optimal learning environment to stimulate redesign:

1. Good health care for good learning: patient care as the context for resident learning;
2. Reducing inefficiencies: making learners and others in the frontlines change agents to improve the learning and working environment;
3. Using objective definitions of educational outcomes (the general competencies) to facilitate improvement in the learning environment;
4. Standardizing patient care to enhance its effectiveness: effect on learning and future practice;
5. Seeking a new conceptualization of professionalism: Educating residents for multi-disciplinary team and shift-based approaches to care; and
6. Patient safety as a system-level property of the learning environment

Several of the conference speakers illustrated concepts from the six design topics, or provided concrete examples of innovation that related to one of the areas. Tina Foster, MD, Associate Director, of the Dartmouth-Hitchcock Leadership Preventive

Medicine Residency, illustrated how the residency program uses patient care as the context for both resident learning and systems improvement.

This preventive medicine program is unique in a number of ways. First, residents complete this program in conjunction with residency education in a clinical specialty. Goals of the residency include improving the care of a defined population of patients served by Dartmouth-Hitchcock Medical Center; through this residents gain an understanding of the processes and outcomes of care for this patient population, and identifying opportunities for improvement. Residents actively institute and test changes in care. Through this, they develop specific improvement competencies for application in their subsequent practice. Examples of their activities are shown in **Exhibit 1**.

Exhibit 1

Patient Care Improvement in the Dartmouth Preventive Medicine Leadership Residency

- Improve safety/efficiency of sedation for endoscopic procedures
- Improve provision of screening services in General IM clinic
- Rapid Response Team implementation and outcomes
- Improve medication management for major depression
- Improve diagnosis and treatment of obesity in primary care
- Improve post-operative pain management
- Improve advance directive process

Tina Foster, MD, Dartmouth Preventive Medicine Leadership Residency

Three Design Sessions

To facilitate the development of concrete ideas for the redesign of the learning environment, participants were organized into design teams of 12 to 15 members. Teams were assigned one of the six topics and participated in three structured design sessions that examined different attributes of the learning environment, to explore opportunities for innovation and improvement.

During the three linked design sessions, the teams developed ideas that centered on the six attributes of a good learning environment into increasing refined and concrete

“In Keegan and Lahey’s approach, the focus is on identifying and addressing blind spots in personal and institutional frameworks of assumptions about what prevents change that creates opportunities and momentum for achieving our aspirations.”

plans for redesign of the learning environment. The first session explored obstacles to the redesign of the learning environment, and the second allowed attendees to refine their designs by applying ideas from other industries and the perspective of patients and learner. During the third session, the finished designs were evaluated by all conference participants, using a “red light, green light” approach.

The First Design Session

The first session used a matrix developed by Robert Keegan and Lisa Lahey and presented in the book “How the Way We Talk Can Change the Way We Work”.³

The objective was to elicit creative ideas and possible solutions to facilitate high-quality resident education. Through the matrices attendees explore aspirations and competing commitments that present barriers to change in the learning environment. A major focus of the matrix is the “Big Assumption” in column 4 of the matrix and the relationship

“For the example of the development of the clinical teacher, this included giving up the notion of the “academic triple threat,” accepting that some members of the faculty will not be teaching at all; compensating for the fact that excellent teachers will have reduced research and patient care activity for excellent teachers; and giving up the idea that teaching is free.”

between it and the aspirations for resident education. This column represents the critical difference between Keegan and Lahey and other approaches to manage resistance to change. In Keegan and Lahey’s approach, the focus is on identifying and addressing blind spots in personal and institutional frameworks of assumptions about what prevents change that creates opportunities and momentum for achieving our aspirations.

Exhibit 2

Clarifying the Competing Commitments in the Design of the Future Learning Environment⁽¹⁾

Topic 1: Development of the Clinical Teacher

	Column 1: Commitment the commitment from being realized	Column 2: What prevents commitments	Column 3: Competing	Column 4: Assumptions
	The language of commitment (Our aspirations for education)	From the language of blame to the language of responsibility	From “New Year’s Resolutions” to understanding commitments	From the “assumptions that hold us” to the assumptions we hold”
Formative questions	<ul style="list-style-type: none"> • What activities and attributes contribute to a high-learning learning environment? • What commitments are implied? (We are committed to...) 	<ul style="list-style-type: none"> • What activities are really happening in programs today? • What are the ‘real-world’ constraints? 	<ul style="list-style-type: none"> • What about the present prevents the activity in column 1? • Are there risks to giving up column 2? What are they? 	<ul style="list-style-type: none"> • If there is a negative in the third column response, eliminate it and re-create the sentence. • If there is no negative, further examine the statement
	<ul style="list-style-type: none"> • We are committed to developing faculty as high-quality educators • We are committed to evaluating faculty as educators • We are committed to rewarding high quality teaching • We are committed to providing training on basics 	<ul style="list-style-type: none"> • Teaching is seen as a burden, not an honor • Residents are being taught by non-educators • Lack of resources-time, training, money • Lack of reward system to encourage good teaching • Lack of feedback • Under valuing resident education • Lack of respect for teaching 	<ul style="list-style-type: none"> • Promotion values productivity, not teaching • Costly to teach • Lack of respect for teaching • Risk: decreased academic and clinical productivity (money) 	<ul style="list-style-type: none"> • Teaching is equally valued as research/clinical practice • Teaching will result in long-term improved patient care
Getting Concrete: Test what you have come up with	<ul style="list-style-type: none"> • This represents a commitment we genuinely hold (not aspire to, but genuinely hold now). • It is a commitment not fully realized at this time. 	<ul style="list-style-type: none"> • Go beyond assigning or taking or taking blame 	<ul style="list-style-type: none"> • For many commitments we genuinely hold to affect change, there is another commitment that prevents this change that we need to release ourselves from. 	<ul style="list-style-type: none"> • Explore the history of the Big Assumption. Look for experiences that cast doubt on the Big Assumption. • Develop one or more new assumptions, and design and run a safe modest test.
	<ul style="list-style-type: none"> • We believe that faculty development is possible and is a good investment • We are committed to this, but it has not been fully realized 	<ul style="list-style-type: none"> • Funds appropriated to teaching • Select and develop the best teachers • Concrete rewards for good teaching 	<ul style="list-style-type: none"> • Give up image as expert • Research and patient care activity will be decreased for some • Some will not be teaching • Give up idea that teaching is free 	<ul style="list-style-type: none"> • Not all doctors are good teachers • Teaching requires development • Teaching is not free • Culture needs to be changed to value teaching

⁽¹⁾ Adapted by Paul Batalden and I. Philibert from: Kegan R and Lahey L, *How the Way We Talk Can Influence the Way We Work*. San Francisco: Jossey-Bass, 2001.

The first column of the Keegan and Lahey matrix focuses on commitment. An example developed during this first design session dealt with developing clinical teachers. The commitments expressed included the following: 1) developing faculty to be high-quality educators; 2) evaluating faculty as educators; and 3) rewarding high quality teaching, and providing faculty development in “teaching basics.” The second column identifies the attributes of the real-life experience that create a barrier to realizing these commitments.

For the example of the development of the clinical teacher, attendees perceived the following competing commitments:

1. Lack of respect and appreciation for teaching, which is viewed as a burden, not an honor;
2. Promotion systems that value clinical productivity over teaching;
3. Many faculty mentors and supervisors lacking formal training as teachers;
4. Lack of resources (personnel, funding, time);
5. Lack of reward systems to encourage good teaching;
6. Lack of feedback; and
7. Under-valuing resident education.

Another cell in the matrix solicits information about practical ways to overcome these barriers. For the example of the development of the clinical teacher, this included giving up the notion of the “academic triple threat,” accepting that some members of the faculty will not be teaching at all; compensating for the fact that excellent teachers will have reduced research and patient care activity for excellent teachers; and giving up the idea that teaching is free.

Rethinking the “Big Assumption:

The final column moves the thinking from the “Big Assumption” to a workable truth. For the example of the development of the clinical teacher, attendees reported the following in this column:

1. Teaching is equally valued as research/clinical practice;
2. Teaching will result in long-term improved patient care;
3. Not all doctors are good teachers;
4. Teaching requires development;
5. Teaching is not free;
6. We need to change the culture to value teaching.

After completing the matrices, the teams used open discussion and nominal technique to select specific design ideas within their topic for further development during the conference’s three design sessions. A graphic example of a completed Keegan and Lahey matrices is shown at **Exhibit 2**.

Common Barriers to Change in the Learning Environment

Using the matrices, the design team explored the role of competing commitments in their daily work. This sought to identify the forces supporting and hampering efforts to redesign the learning environment at the program, sponsoring institution and national levels. Across the multiple matrices participants completed, there were a number of common barriers to realizing the commitments to an optimal learning environment. Many of the barriers mentioned by participants related to a lack of needed resources (financial, time, staff, training and development) or to a mismatch of institutional resources and resident education goals. One added factor mentioned was an institutional focus on cost reduction that creates an added barrier to innovation that requires a financial commitment.

Other barriers related to general resistance to change, with faculty resistance and lack of buy in mentioned specifically in a sizable number of the matrices. They also included lack of faculty role models; faculty that gave clinical and research productivity a higher priority than teaching; and

“Many of the barriers mentioned by participants related to a lack of needed resources (financial, time, staff, training and development) or to a mismatch of institutional resources and resident education goals.”

faculty development needs in a number of different areas, including skills for teaching and evaluating residents, and understanding the general competencies, particularly practice-based learning and improvement and systems-based practice. Barriers to meeting aims for teaching the competencies include a lack of infrastructure, including curricula and educational models for teaching quality improvement, systems-based practice, patient safety and practice in teams.

Problems with the physical plant and infrastructure in teaching institutions were also mentioned, as were the obstacles to the redesign of the residency experience posed by the rotational design of training that makes it difficult to organize longitudinal and team-based learning experiences. Participants also noted that the limits on duty hours make change in the

Exhibit 3

Barriers to the Redesign of the Learning Environment

- Lack or mismatch of resources (financial, time, training)
- Resistance to change and lack of buy-in
- Lack of infrastructure, systems literacy
- Resistance to change and lack of buy-in
- Attending physician development needs
- Faculty focus on clinical and research productivity
- Lack of role models
- Lack of empowerment and accountability
- Lack of assessment strategies, valid tools and meaningful feedback
- Lack of resident leadership and leadership training
- Lack of curricula and infrastructure to teach the competencies, quality improvement and patient safety

2006 ACGME Design Conference on the Learning Environment

learning environment more difficult. Finally, another common barrier to realizing commitments necessary for the redesign of the learning environment included lack of data to facilitate improvement. Geographic separation of patients, duty hour limits and other factors interfere with team meetings and team care. A list of selected other common barriers that emerged from the matrices is shown in **Exhibit 3**.

¹ Yoji Akao (Ed.). *Quality Function Deployment: Integrating Customer Requirements into Product Design*. (Translated by Glenn Mazur, Productivity Press, 1990.

² Patient-Centered Care Information Institute for Health Care Improvement (IHI) <http://www.ihi.org/IHI/Topics/PatientCenteredCare/>

³ The matrix is from Keegan R and Lahey L, *How the Way We Talk Can Influence the Way We Work* (San Francisco: Jossey-Bass, 2001), and was adapted by P. Batalden and I. Philibert.

The Second Design Session

During the second design session, participants continued the conversation about and opposing forces for change in the learning environment, and expanded the discussion to concepts from other industries and the perspective of a broader group of stakeholders, including learners and patients.

“It approached design within a larger context of change in education and practice, and the design concepts that could be adopted and adapted from other industries, including industries and settings not traditionally looked to medical education.”

The session had two objectives. It approached design within a larger context of change in education and practice, and the design concepts that could be adopted and adapted from other industries, including industries and settings not traditionally looked to medical education. A second objective was to refine the designs participants had begun during the first design session, by bringing in the perspective of learners and patients. Discussions by participants touched on the context of reform in medicine and education, including other sectors of higher education, and how these may contribute to a framework for redesign of the learning environment.

During the second design session, the teams re-examined the completed matrixes from the first session, with each team drawing on the presentations and their own experience and thinking to refine the ideas. In their discussion to develop more refined design ideas, the teams were asked to consider the Committee on Innovation in the Learning Environment’s working definition of the learning environment shown in **Exhibit 4** as a guiding principle.

Exhibit 4

Working Definition of the Learning Environment

An environment that enables resident physicians to learn the art and science of medicine and apply that learning in a monitored and mentored setting within an institution committed to:

- Competency-based education and practice;
- Support for professional and personal development;
- Educational and clinical excellence.

Committee on Innovation in the Learning Environment, 2005

Borrowing from Other Industries

A key aspect explored during the second session involved whether redesign of the learning environment could draw on ideas from other industries. One presentation, by Emily Patterson, PhD, an expert in industrial engineering and ergonomic design from Ohio State University, featured ideas about safe design and attention to human factors in complex environments. Dr. Patterson discussed efforts to enhance safety to the physical design of the environment and the design of displays for conveying maximum information with minimal effort.

Exhibit 5

Aims and common attributes of hand-offs in other industries

- **Increase Effectiveness**
Face-to-face verbal, interactive updates
- **Increase Effectiveness and Efficiency**
Incoming individual or team scans historical data prior to verbal update
- **Error detection, recovery, prevention**
Outgoing individual or team oversees work during and after hand-off
- **Transfer up-to-date information**
Annotated ambulance “meal break” form
- **Unambiguous responsibility**
Person with headset answers calls

Source: Patterson et al, 2004, settings include NASA, nuclear power, railroad and/or ambulance dispatch

She noted that her presentation would draw extensively on concepts from human factors engineering, and that the focus in human factors is on individuals in a given setting, and the configuration of their environment, information systems and any other tools they may have available to assist them in carrying out a particular task or set of tasks.¹

Dr. Patterson discussed ideas for how to adapt the learning and task environment using concepts from industrial engineering and human factors research. They included every-day examples such as the design of the automobile dashboards to enhance attention to external cues while performing such tasks as changing radio stations. They also included research in nuclear power and other high-risk industries that have sought to enhance safety to the physical design of the environment and the design of displays for

“One presentation featured ideas about safe design and attention to human factors in complex environments.”

conveying maximum information in a simple, transparent way that requires less cognitive effort for comprehension and that clearly highlights potential critical or dangerous states.

Dr. Patterson’s work seeks to apply human factors engineering principles to improve the interface between humans and systems in health care. Two major focal areas are designing medical informatics systems to enhance patient safety, and improving the patient hand-off process. For the second focal area, Dr. Patterson and colleagues have worked to adapt examples from other “high risk” industries.

One example was about end of shift transfers (hand-offs) in industries such as nuclear power, ambulance dispatch and space shuttle flight management. She presented concepts from these industries that are relevant to patient hand-offs. Concepts relevant to hand-offs across several settings included the need to have current information conveyed under time constraints, to be aware of predictable events and contingencies and plans for handling them, and to ensure completion of assigned tasks across multiple teams, while minimizing duplication and “dropped” tasks. Dr. Patterson noted

“Concepts relevant to hand-offs across several settings included the need to have current information conveyed under time constraints, to be aware of predictable events and contingencies and plans for handling them, and to ensure completion of assigned tasks across multiple teams, while minimizing duplication and “dropped” tasks.

that more evolved version of hand-offs in some industries expressly use the hand-off process to check assumptions and assessments, and to try and correct potential errors in ongoing management. A list of the goals of hand-offs in other industries and the strategies used to meet them, shown in **Exhibit 5**.

In the discussion that followed her presentation, Dr. Patterson noted that there is interest in translating concept from human factors engineering, as it is used in complex, high-risk settings, such as nuclear power and aviation to health care. She added that the goal in these settings and in health is to increase resiliency and reduce errors. In a recent editorial in the *Annals of Surgery*, Dr. Patterson that the translation of learnings from other high-risk industries to health care is a complex undertaking, and will require multi-

“Participants also explored ways to involve patients in their care and learners in their education; and using the work from this and the first session, developed 4 to 5 specific ideas for change to create tomorrow’s learning environment.”

year collaborations between health care and individuals with expertise not traditionally found in the health care sector.² She closed by noting that she and other representatives of her discipline are deeply interested in working with the health care sector.

Teams used the concepts from the presentations by the invited speakers. Dr. Dreyfus’ remarks related to teaching the competencies, and Dr. Elliott Fischer’s talk about variation in spending practices and intensity of service was particularly relevant to the design teams that had been asked to develop ideas for how to reduce variation in care in teaching settings, and how to incorporate these concepts into resident education.

The design teams developed ideas that emerged from their work with the Keegan and Lahey matrix into 4 to 5 specific plans for change to create tomorrow’s learning environment. Participants also explored ways to involve patients in their care and learners in their education. The teams thought broadly about the factors relevant to the development of concrete plans for redesigning aspects of the learning environment, in a way that would facilitate implementation at their local level.

A number of concepts around improvement surfaced during these discussions, including local and institutional context, local knowledge about and interest in improvement, and concrete ideas for overcoming the barriers and “big assumptions” identified through the Keegan and Lahey matrix. The example below shows the design team’s refinements of the idea for better development of clinical teachers.

Design Exercise: Developing clinical teachers

Process Elements

1. Instruction in adult education and peer to peer teaching
2. Development and use of teaching benchmarks
3. Faculty self-reflection
4. Improved performance evaluations
5. Formal coaching and mentoring with plans for improvement

Involving learners and patients

1. Honest, effective, constructive feedback from learners
2. Develop individual learning plan based on learning style
3. Evaluate learning outcome
4. Patients as evaluator of clinical teachers (both directly and indirectly)

Specific Ideas to be incorporated into the final plan

1. Faculty development at the institutional level
2. Online teaching modules
3. Expert evaluation of skills
4. Teaching portfolios
5. Use of “standardized learners”
6. Mentors for junior faculty
7. Development of a core clinical teaching faculty
8. National or institutional certification of “master teachers”
9. Teaching as a viable career path

“Emily Patterson’s presentation on human factors engineering was particularly relevant to the teams addressing safety and patient care as the context for learning.”

In their discussion of approaches to refine their ideas during the second design session, attendees drew on the examples provided by the presenters. Emily Patterson’s presentation was particularly relevant to the teams addressing safety and patient care as the context for learning.

¹ Woods DD, Hollnagel E. *Joint Cognitive Systems: Patterns in Cognitive Systems Engineering*. Boca Raton, FL: Taylor & Francis, 2006.

² Patterson ES. Editorial: Communication Strategies from High-Reliability Organizations: Translation is Hard Work. *Annals of Surgery* 245(2); 2007; 170-2.

Involving Constituents in the Redesign of the Learning Environment: The Results

"I always know when I hear a good idea because of the feeling of terror which seizes me." – James Franck, Nobel Laureate Physics

The Third Design Session

During the final design session, teams selected a few high-impact initiatives to improve the learning environment for evaluation by all attendees during an evaluation session at the end of the design conference. Selection criteria included that

"Ideas were submitted for evaluation by the other attendees, using a "red, yellow, green light" evaluation strategy."

these ideas could be adapted or adopted across a wide variety of programs and institutions for further development and refinement. Ideas were submitted for evaluation by the other attendees, using a "red, yellow, green light" evaluation strategy.

Attendees used post-it notes in the three colors to rate ideas from red (serious concerns) to yellow (caution, suggestions for improvement) to green (implementation-ready). Raters also noted their comments on these notes, to offer added information that would facilitate further refinement of the ideas. These comments were aggregated and this section of the proceeding includes both a list of all final ideas that were developed during the design session as well as the aggregated list of concerns and cautions.

In their evaluation of the ideas, participants noted that innovation is important to curriculum development and advancing innovation in education, but too frequent changes can undermine long term educational goals. Some major initiatives like the Internal Medicine Review Committee's Educational Innovation Project (EIP) require time, resources and yearly reassessment of progress. Some attendees felt that the effectiveness of innovations in resident education needs to be evaluated (ideally using educational outcomes) prior to the ACGME or a Review Committee encouraging a larger group of programs to implement the new approach, and that the Committees will have to decide what to give up to make time for outcomes assessment and innovation.

Other ways to promote innovation discussed during the design session included funding opportunities to increase recognition by the sponsoring institution, and bonus points for programs that innovate using the plan-do-check-act (PDSA) cycle or a similar process. Another way to encourage programs to innovate more was to allow greater flexibility for processes and hold them accountable for outcomes.

Topic 1: Good health care for good learning: Patient care as the context for resident learning

Ideas for Redesign

As they evaluated re-design ideas that used patient care as the context for learning, participants noted that a major barrier to be overcome in redesigning the learning environment was to reduce patient care and productivity pressures that reduce opportunities for learning in many settings. During design sessions 1 and 2, the teams had identified time constraints and faculty already being or feeling overextended as a barrier to improving learning opportunities in a clinical setting. The discussion highlighted the pressure on faculty to be clinically productive, and the fact that most meaningful educational activities in a clinical setting, such as evidence-based medicine or point-of-care access to information either have significant financial or time requirements and/or reduce clinical throughput, especially in ambulatory settings.

Idea 1: Incorporate Evidence-Based Medicine into case-based learning

1. Develop a collection of cases, addressing curriculum requirements
2. Find specialty super-teachers, and teach them how to facilitate
3. Create an on-line tutorial for finding and using guidelines and a web-based case template
4. Develop evaluation tools

Peer Evaluations: Red/Do not Implement: 5%
Yellow/Caution: 25%; Green/It's a Go: 70%

Idea 2: Provide "point-of-care" access to Evidence-Based Medicine (EBM) resources

1. Identify champions in the faculty and administration
2. Create point-of-care access to easily searched databases
3. Develop consensus to practice EBM and accepted guidelines and resources
4. Implement hardware and software in accessible locations
5. Provide training in the principles of EBM and convey expectation that it should be used in resident education
6. Provide faculty development in using EBM on teaching and work rounds
7. Track use of EBM and evaluate the effect on patient care

Peer Evaluations: Red/Do not Implement: 8%
Yellow/Caution: 25% Green/It's a Go: 67%

“...innovation is important to curriculum development and advancing innovation in education, but too frequent changes can undermine long term educational goals.”

In their evaluation of ideas, attendees emphasized the need for concrete, actionable ideas, noting that vague ideas may garner support at the conceptual stage, but run into problems when programs try to implement them. At the same time, the critiques of ideas cautioned against ACGME mandating specifics, which would leave programs without the option to adapt approaches to local needs and circumstances.

Attendees brought a healthy dose of humor and realism to the discussion, with comments such as, “Will I have another job, fixing the things in the system discovered at these conferences?”

Topic 2: Reducing inefficiencies: Making learners and others in the frontlines change agents to improve the learning and working environment

Ideas for Redesign

Idea 1: Develop resource allocation plans to reduce reliance on residents for clinical service

1. Develop staffing plan without residents to identify service needs
2. Make financing of residents and education transparent
3. Review daily tasks of residents to identify service and educational components of each
4. Re-examine faculty role in patient care
5. Commit funds to support staffing for service needs
6. Apply appropriate personnel to provide non-educational services

Peer Evaluations: Red/Do not Implement: 0%
Yellow/Caution: 34% Green/It's a Go: 66%

Idea 2: Develop communication algorithms to reduce unnecessary interruptions

1. Eliminate numeric pagers
2. Characterize portion of elective, urgent and emergent communications to residents
3. Examine options (e-mail, cell phones, beeper) multidisciplinary rounds
4. Protected time protocols for non-urgent communications
5. Involve care team members (nurses, social workers) in plan refinement and get buy-in
6. Enact plan

Peer Evaluations: Red/Do not Implement: 9%
Yellow/Caution: 16% Green/It's a Go: 75%

Idea 3: Empower residents to develop care process and quality solutions

1. Mandate basic education in Quality Improvement
2. Develop Institutional policies and tools for non-punitive error reporting
3. Construct approach to creating resident/team specific outcome data
4. Regular reporting of outcome data to care teams
5. Require residents to attend QI activities and provide protected time
6. Give residents mechanisms to improve quality (i.e. Resources, leadership positions, etc.)

Peer Evaluations: Red/Do not Implement: 0%
Yellow/Caution: 12% Green/It's a Go: 88%

Idea 4: Multidisciplinary rounds to develop care teams and improve value, outcomes, satisfaction and learning

1. Build Support with dean, DIO, Chiefs of Service, Nursing, Social Services, Pharmacy and Executive Management Team
2. Build a vision and stories of multi-disciplinary rounds with residents, faculty and stakeholders
3. Design the plan/flow of rounds
4. Conduct a pilot to ensure early success
5. Assess patient care and learning outcomes

Peer Evaluations: Red/Do not Implement: 7%
Yellow/Caution: 50% Green/It's a Go: 43%

“...most meaningful educational activities in a clinical setting, such as evidence-based medicine or point-of-care access to information either have significant financial or time requirements and/or reduce clinical throughput, especially in ambulatory settings.”

Idea 5: Incorporate leadership training in the residency curriculum

1. Frontline workers will learn to recognize inefficiencies and be empowered to eliminate them
2. Build faculty support
3. Develop Curriculum for Leadership with faculty and residents
4. Pre-intervention metrics
5. Build Formal Organizational Support and multidisciplinary support
6. Implement pilot for early success

Peer Evaluations: Red/Do not Implement: 2%
Yellow/Caution: 17% Green/It's a Go: 81%

Two of the highest scoring ideas from an implantation perspective were Idea 3 in this section, which called for empowering residents to develop care process solutions, and Idea 5, which proposed the incorporation of leadership training into the residency curriculum. The evaluations that gave these ideas the “green light” noted that these initiatives capitalize on residents’ extensive knowledge of the clinical Microsystems and the opportunities for improvement. The recommendation for leadership training contributes to the goal of involving residents in improving their care and learning environment by giving them tools and empowering them.

“The evaluations noted that these initiatives capitalize on residents’ extensive knowledge of the clinical Microsystems and the opportunities for improvement.”

In contrast, another idea in this section, which specified communication algorithms to reduce the paging burden on resident, received a high percentage of red (“no go”) evaluations. This idea had been suggested in an article in the New England Journal of Medicine (Volpp and Grande¹). In the peer evaluations, some participants lauded this approach; other rejected it as unrealistic, noting that limits on paging may adversely affect patient care and that residents need to be part of communication both to benefit their acquisition of practice skills and to ensure high quality patient care in teaching settings.

Topic 3: Using the general competencies to facilitate improvement in the learning environment

Ideas for Redesign

Idea 1: Review Committees mandate use of common assessment tools for the General Competencies

1. Request Review Committees (RCs) in each specialty to require at minimum one tool to be used to evaluate each core competency
2. Cultivate consensus among the RC chairs regarding the need to specify instruments
3. Convene development “pods” of program directors and relevant stakeholders to select/develop tools/instruments
4. Assessment methods and tools must be affordable and feasible to use across all programs in the specialty
5. Require residency programs to use these tools at minimum, but they may use others as well

6. Develop strategy for pilot testing and validation
7. Implementation roll-out

Peer Evaluations: Red/Do not Implement: 12%
Yellow/Caution: 31% Green/It’s a Go: 57%

Idea 2: Time for reflection to improve clinical practice (in a multi-disciplinary team)

1. Address daily decisions; daily practice questions and frustrations
2. Should encompass, team reflection, mentored reflection and self reflection
3. Use reflection as an assessment of how the multidisciplinary team is working, and as an instructional method for Practice-Based Learning and Improvement
4. During daily rounds, on discharge; bi-annual mentor-big part at least (once per month), or during debriefing after simulation
5. Use the team to develop guidelines

Peer Evaluations: Red/Do not Implement: 5%
Yellow/Caution: 33% Green/It’s a Go: 62%

Idea 3: Enhancing Systems-Based Practice education in residency

1. ACGME-develops a list of systems and definitions
2. Reporting System occurrences with feedback
3. Global format for sign-off
4. Institutional accountability
5. Residents join Hospital Committees
6. Training in team leadership the Multi-disciplinary Team
7. Cross Training-resident rotates with staff and administration

Peer Evaluations: Red/Do not Implement: 5%
Yellow/Caution: 23% Green/It’s a Go: 72%

Topic 4: Standardizing patient care to enhance effectiveness: Effect on learning and future practice

Standardizing patient care to make it more efficient was informed to a considerable degree by the presentation by Elliott Fischer, MD, Professor of Medicine, Center for the Evaluative Clinical Sciences, Dartmouth Medical School. Dr. Fischer presented an analysis of variations in amount and cost of care provided in different regions, using data from local area analysis. This showed sizable differences in the quantity of care provided to local populations. He noted differences in per patient expenditures among regions were largely due to these differences in quantity of care (intensity) for similar populations.

“Dr. Fischer noted that for many conditions, there appears to be an inverse relationship between the amount of care provided and health outcomes. He termed this phenomenon the ‘paradox of plenty.’”

Dr. Fischer differentiated between care that should always be provided to all patients (effective care); care where the amount provided is influenced by patient preferences, due to trade-offs among risks and benefits that contribute to variation in patients’ choices for more or less aggressive treatment, and care where greater supply of health professionals results in a great amount of care provided to comparable populations (supply-sensitive care). Examples of three types of care are provided in **Exhibit 6**. Dr. Fischer noted that for many conditions, there appears to be an inverse relationship between the amount of care provided and health outcomes. He termed this phenomenon the “paradox of plenty.” Many of the ideas formulated under the topic of standardizing care used technology to identify and expose variation and to provide guidance at the point of care, including evidence based medicine available in a just-in time format for faculty and learners.

Ideas for Redesign

Idea 1: Develop an ACGME Requirement for use of an electronic medical record (EMR) with computerized physician order entry (CPOE) and decision support

1. Implement CPOE at the institutional level
2. Develop one comprehensive website with care guidelines and report cards for faculty and specialty-specific performance (phased-in)
3. Link resident assignment to faculty to good performance
4. Institute shared review of metrics and use of metrics in residents educational portfolios
5. Develop business and education case for EMR/CPOE to secure resources
6. Have Review Committees require EMR and CPOE or, at minimum, a plan for working toward it (ACGME would define required/desirable features of EMR used in teaching institution, which must include ability to track residents’ performance separately from attending physicians, using the EMR)

Peer Evaluations: Red/Do not Implement: 19%
Yellow/Caution: 27% Green/It’s a Go: 54%

Idea 2: Incorporate Evidence-based Medicine into the learning environment using CPOE

1. Implement CPOE with evidence-based medicine-informed decision support (CILE)
2. Incorporate evidence-based medicine into faculty/resident evaluations
3. Faculty and staff development workshops on evidence-based medicine and team functioning
4. Evidence based medicine compliance officer
5. Make evidence-based medicine guidelines accessible to patients

Peer Evaluations: Red/Do not Implement: 9%
Yellow/Caution: 20% Green/It’s a Go: 71%

Idea 3: Change the culture of the Morbidity and Mortality (M & M) Conference to facilitate education and improvement

1. Restructure M & M Conference to facilitate continuous improvement
2. Rename M & M Conference and change emphasis to patient safety
3. Recruit residents who have prior experience with being team players
4. Teach leadership skills
5. Develop a patient advisory group
6. Conduct “Customer” satisfaction survey and cross cultural survey
7. Focus on skills relevant to improving the clinical micro-systems, e.g., problem solving

Peer Evaluations: Red/Do not Implement: 37%
Yellow/Caution: 11% Green/It’s a Go: 52%

Exhibit 6

Effective care: Evidence-based services that all patients should receive. No tradeoffs are involved.
Acute revascularization for AMI

Preference-sensitive care: Treatment choices that entail tradeoffs among risks and benefits. Patients’ values and preferences should determine treatment choice.
CABG for stable angina

Supply-sensitive care: Services where utilization is strongly associated with local supply of health care resources
Frequency of MD visits, specialist consultations, use of hospital or ICU as a site of care

Elliott Fischer, MD, Dartmouth-Hitchcock Medical Center

Idea 4: Share information on variation in care with residents and faculty

1. Assemble list of collaborators and stakeholders and clearly communicate goals and benefits of reducing variation using evidence
2. Identify what variation parameters should be measured and reported and assemble a list of available data resources
3. Develop a system that can provide resident-specific data
4. Share knowledge and incorporate resident variation data in teaching and evaluation processes
5. Educate institution, insurers and public about benefit

Peer Evaluations: Red/Do not Implement: 0%
Yellow/Caution: 17% Green/It's a Go: 83%

Idea 5: ACGME Requires Computer-based Physician Order Entry (CPOE) and Electronic Medical Record (EMR) for practice based learning and improvement

1. ACGME requires CPOE and EMR in teaching institutions through the institutional requirement and set a specific date (standards must emphasize the importance of resident participation in PBLI-focused work)
2. Study the use of CPOE/EMR in teaching institutions, share results with others, including prospective residents
3. Obtain seed grant funding
4. Residents are active participants in design of order sets, prioritization of pathways, and have a forum to share guidelines, and their research requirements can include development or revision of guideline
5. The EMR will allow resident-specific, team-specific and micro-system specific measurement and data management

Peer Evaluations: Red/Do not Implement: 33%
Yellow/Caution: 33% Green/It's a Go: 33%

Idea 6: Make residents change agents through participation in the developing clinical guidelines or pathways

1. Identify, develop and support faculty, resident, administrative and staff champions, and communicate guidelines and expectations clearly to faculty, residents, administration
2. Assemble a resource guide for developing guidelines to include National Guideline Clearinghouse standards
3. Have residents participate in guideline/pathway development and evaluation and involve them in hospital QA/QI processes

4. Measure outcomes and report results
5. Institutions should certify that residents know guideline/pathways
6. Residents should know how to assemble multi-disciplinary team for guideline development and review

Peer Evaluations: Red/Do not Implement: 13%
Yellow/Caution: 23% Green/It's a Go: 64%

Thoughts about the Limitations of Present-day Technology

Many of the recommendations on this design topic called for technology to facilitate standardization and transparency of care. Common to many ideas are the use of the electronic medical record (EMR) and computer-based physician order entry (CPOE) to collect and convey information about care to faculty and residents, as well as serve the data foundation for standardization. Participants who evaluated these ideas noted that the EMR platforms currently used at their institution lack the capabilities to support this type of use, and are difficult to impossible to customize for this type of expanded use. The critiques noted that features particularly desirable for standardization of care currently not available in many EMR platforms include links to evidence-based medicine and quality improvement resources, and the ability to use them for point-of-care teaching and self-learning.

“...EMR platforms currently used at attendees' institution lack the capabilities to support this type of use, and are difficult to impossible to customize for this type of expanded use.”

Limitations common in the peer critiques of evidence-based medicine noted that many current EBM systems do not accept patient preference and/or the abilities and experience of experts. In addition, attendees noted that large areas of medicine presently are not evidence-based, and some may never progress in that direction. A few participants expressed that residents should be explicitly taught when to depart from the guidelines. The solution for many was to try and involve residents in the design and application of clinical guidelines. Benefits of EBM were thought to include reduced variation in care, and making the professional development of learners and faculty rely more on scientific evidence.

The evaluations also indicated concern about electronic mechanisms replacing face to face communication between residents and faculty and among residents. Some suggestions were simple, such as the idea to enhance the information

management system to support resident education through tools for decision support, order entry and forcing functions to reduce variation in care. Others were complex. Attendees brought a healthy dose of reality to the discussion, with comments such as, “Will I have another job, fixing the things in the system discovered at these conferences?”.

Topic 5: A new conceptualization of professionalism [for team and shift-based approaches to care]

Most of the raters’ comments about the ideas for this design topic highlighted the complexity of the shift from an individual notion of professionalism, responsibility for patients and continuity of care, to one where these concepts operated at the level of a patient care team.

Comments noted the magnitude of the culture change

“Many attending physicians are still adapting and may be ambivalent about the new model.”

this will require, and the fact that it may be threatening to faculty who were educated and have practiced under a model of individual responsibility and who may equate “professionalism” with an individual sense of obligation. Many attending physicians are still adapting and may be ambivalent about the new model. Faculty having embraced a model of “team-based” professionalism is critical to teaching and modeling it successfully.

Ideas for Redesign

Idea 1: Teach Residents to be Part of a Team

1. Initiate open discussion about the trade-off’s between one patient/one doctor vs. a team-based approach to care
2. Define goals for team-based care involving residents and designate resident responsibilities
3. Simulate team-based care, residents act as nurses, patients, pharmacy
4. There should be a larger emphasis on team care within multiple departments of the institution
5. ACGME should facilitate team-based care by reducing emphasis on “rotations” (time on a service) vs. achieving competency goals

Peer Evaluations: Red/Do not Implement: 0%
Yellow/Caution: 13% Green/It’s a Go: 87%

Idea 2: Redefine “Shift Work” and Continuity of Care in Residency

“Shift work” will be increasing part of resident experience. Residents need to learn to function there.

1. ACGME need to redefine continuity of care requirements
2. Hospital services need to be available 24 hours/7days per week (Radiology, OR)
3. Teams need to be empowered and responsible roles defined
4. Handoffs need to be governed by “protocol” (checklists, technology)

Peer Evaluations: Red/Do not Implement: 5%
Yellow/Caution: 18% Green/It’s a Go: 77%

Idea 3: Adapt Professionalism to the Team Care Environment and Local Culture

Coordinate faculty development and resident education to allow a concept of professionalism that can be immediately integrated into the patient care environment and the local culture.

1. Combine resident and faculty development on communicating across hierarchy and developing a common language
2. Offer CME and “portfolio” credit
3. Model communication through video/role play (Communication among chief residents, junior residents, attending physicians and other health professionals) as a grand rounds or noon conference topic
4. Use existing venues (M & M, morning conference in a “value added” way)
5. Incorporate faculty development into institutional requirements

Peer Evaluations: Red/Do not Implement: 7%
Yellow/Caution: 22% Green/It’s a Go: 71%

Idea 4: Multi-Disciplinary Teaching and Work Rounds with Resident-Initiated Discussions around Uncertainty

1. Restructure teaching/work rounds to include physician and non-physician multidisciplinary members
2. Ask for resident-initiated discussion that centers on uncertainty or a question about patient care
3. Get resident buy-in
4. Conference to educate residents and faculty, other team members
5. Faculty development
6. Script for uncertainty discussion

Peer Evaluations: Red/Do not Implement: 4%
Yellow/Caution: 34% Green/It’s a Go: 62%

Idea 5: Develop sessions for modeling clinical and reasoning skills by faculty for open discussion and feedback by residents and other faculty.

1. Create scheduled time for the sessions and debriefing
2. Develop format/structure for debriefing
3. Patient can be actual or simulated
4. Include non-physician team members in debriefing
5. Have a focus group on how to deal with faculty sensitivity in sensitive manner

Peer Evaluations: Red/Do not Implement: 0%

Yellow/Caution: 41% Green/It's a Go: 59%

Comments on Redesigns to Integrate Professionalism into Team and Shift-based Approaches to Care

Among the “do not implement” comments several attendees noted that a lot of attention has been focused on professionalism, and that it is time to address the other general competencies.

Other comments in the “red” section warned against the dangers of a team-based approach resulting in a loss of the sense of responsibility on the part of the individual residents.

Many of the comments in the “yellow/caution” section noted that the ideas in response to this design topic still were potentially important, but too theoretical and lacking the

“Comments noted the magnitude of the culture change this will require and the fact that it may be threatening to faculty who were educated and have practiced under model of individual responsibility and who may equate “professionalism” with an individual sense of obligation.”

details for practical implementation, or they were too vague and required further refinement. One area for clarification was whether the new model of professionalism would be multidisciplinary. The comments also noted that changing established concepts of professionalism could result in significant push-back from faculty who may feel threatened by these new concepts. The comments also noted that faculty development and seeking faculty buy-in would be critical to the success of many efforts to shift to a system where professional responsibilities would rest with the team, rather than the individual. Finally, participants noted that for the new concept to take hold, members of the faculty would have to model it in their daily lives, to change the mindset of their fellow faculty members and the residents. The comments

added that developing this proposed new professionalism mindset in community faculty may present a particular challenge. Among the “green/go” comments, participants noted that ACGME should mandate a certain amount of “faculty development” related to professionalism.

“Several suggestions called for revamping faculty development and resident education to allow a concept of professionalism to emerge that can be integrated into the local culture and patient care environment.”

There was broad agreement among the attendees that there would be significant benefit in added faculty development in professionalism and related topics, and that a valuable tool to develop professionalism would be a few mentors in each setting who could model communication and behavior in a team-based approach to professionalism and professional responsibility. Several suggestions called for revamping faculty development and resident education to allow a concept of professionalism to emerge that can be integrated into the local culture and patient care environment, and that is compatible with current practice, including duty shift, night float, and other ways of dividing up the medical work day. Several attendees noted that professionalism had garnered enough attention (and was difficult to teach and assess) and that programs, institutions and the ACGME should devote added time to the other competency domains. A few comments noted that efforts to “measure” professionalism would be a waste of time, since the construct is complex and observers in clinical settings “know it when they see it.” These individuals felt that consistency in the evaluations of professionalism would be positive, but development of an effective tool is unlikely.

Topic 6: Patient safety as a system-level property of the learning environment

Ideas for Redesign

Idea 1: Provide patient safety education via online resident portfolios

1. ACGME will mandate a standardized model of patient safety education
2. Get Program Director and institutional sign-off
3. Institutional support, and IT and software support
4. Keep it simple
5. Get resident buy-in

Peer Evaluations: Red/Do not Implement: 9%

Yellow/Caution: 38% Green/It's a Go: 53%

Idea 2: Web-based system to support the patient hand-off

1. ACGME will mandate an electronic web-based system for hand-offs
2. Initiate a request for proposals (RFP) process
3. Obtain institutional support
4. Obtain faculty buy-in
5. Train residents to use the electronic hand-off system

Peer Evaluations: Red/Do not Implement: 22%

Yellow/Caution: 36% Green/It's a Go: 42%

Idea 3: Requirement to use safety/QA data in resident education

1. ACGME will mandate use of AQ and safety data
2. Develop a standardized system based on the electronic medical record with IT support
3. Mandated minimum number of cases to be reviewed for safety and opportunities for improvement

Peer Evaluations: Red/Do not Implement: 3%

Yellow/Caution: 6% Green/It's a Go: 91%

“Several attendees noted that professionalism had garnered enough attention (and was difficult to teach and assess) and that programs, institutions and the ACGME should devote added time to the other competency domains.”

Idea 4: Multi-disciplinary case discussions instead of traditional M & M Conference

Goals:

1. Create non-punitive environment to discuss patient safety;
2. Identify and correct system issues that may be leading to errors;
3. Increase awareness of importance of patient safety.

Action Steps:

1. Increase understanding of how discussion and the M & M format improves patient safety;
2. Convey concept to hospital management and patient safety leadership and get buy-in;
3. Promote this effort as a replacement or enhancement to current activity;
4. Design a format that facilitates communication across disciplines/levels of care and get other disciplines' involvement and buy-in (social work, nursing, pharmacy, etc.);

5. Get program director buy-in (emphasize relevance to ACGME core competencies);
6. Use the results of the multi-disciplinary case discussions to identify opportunities for systems-level improvements to patient safety.

Peer Evaluations: Red/Do not Implement: 0%

Yellow/Caution: 19% Green/It's a Go: 81%

Idea 5: Faculty development in how to promote patient safety at the system level

Goals:

1. Change culture of patient safety in the system;
2. Increase faculty knowledge of patient safety;
3. Develop curriculum for faculty in Six Sigma and Lean production.

Action Steps:

1. Add patient safety information to new faculty orientation;
2. Designate departmental faculty “resource person” with expertise in patient safety;
3. Require faculty attendance at “safety rounds” on QI/JCAHO committees;
4. Add “focus on patient safety” to faculty performance reviews.

Peer Evaluations: Red/Do not Implement: 2%

Yellow/Caution: 26% Green/It's a Go: 72%

Idea 6: Role Play and Simulation to Educate Residents about the System

Goals:

1. Teach residents about the roles and skills of other health professionals and the basics of interacting;
2. Increase residents' awareness of elements of system;
3. Clarify residents' role within the system;
4. Ensure that residents understand that others in the system have an important role in patient safety.

Action Steps:

1. Develop conference format and choose facilitator “system thinker”;
2. Sell concept to Program Directors/faculty commit time to this exercise;
3. Select cases and identify participants for a given presentation;

4. Develop role play stations, with participants writing up what occurred (from their perspective);
5. Facilitator leads change in system;
6. Develop feedback loop/communication plan.

Peer Evaluations: Red/Do not Implement: 4%
 Yellow/Caution: 21% Green/It's a Go: 75%

In the evaluations of the design ideas to enhance patient safety, participants emphasized that most proposed interventions carried significant financial and time costs, and that no added funding would be available to offset the added fiscal note. Raters also stressed that the approach needs to be based on good scientific evidence about systems that promote safe patient care, and that development and application of a patient safety curriculum needs to precede evaluation of residents' performance in this area.

Attendees mostly agreed that the ACGME should prescribe the basic format for enhancing patient safety preparation in residency, and should develop and provide the software for a web-based system that residents can download for local use and/or incorporation into their learning portfolio. The comments also suggested that ACGME should develop and provide the software for a web-based portfolio system, but continue to allow paper and other formats, at least for the foreseeable future, and that ACGME should provide added guidance on the uses and benefits of an educational portfolio.

“ACGME should prescribe the basic format for enhancing patient safety preparation in residency, and should develop and provide the software for a web-based system that residents can download for local use and/or incorporation into their learning portfolio.”

Among the concerns with a portfolio mentioned by attendees were security and privacy (who owns and has access to the information), the time to enter the data, and whether the primary use would be to record resident professional development, program improvement or providing information for accreditation. This was one of the areas where a number of evaluators expressed concerns with electronic approaches replacing faculty mentoring. The comments related both to the electronic resident portfolio and to web-based approaches for teaching the principles of patient safety.

¹ Volpp KG, Grande D. Residents' suggestions for reducing errors in teaching hospitals. *N Engl J Med.* 2003 Feb 27;348(9):851-5.

Common Cautions and Concerns in the Evaluations of the Design Ideas

The evaluations overall emphasized the need for concrete, actionable ideas, noting that vague ideas may garner support at the conceptual stage, but run into problems when programs try

“Concerns also related to “measurement overload,” with multiple organizations collecting data separately, and multiple data streams existing, concerns about data validity and less than perfect efforts at analysis and sense-making.”

to implement them. At the same time, some of the critiques cautioned against a highly specific approach that could not be adapted to local conditions and circumstances. Common concerns under the red (no go) rubric included recommended approaches being too costly, labor and time-intensive, too complex, or requiring significant change in local culture, with the potential of this resulting in pushback by faculty and others. The common cautions, which include expected ones and a few surprises are shown in **Exhibit 7**.

Exhibit 7

Common Concerns and Cautions

Expected Concerns

- Time and opportunity costs
- Lack of or need for faculty development
- Data and measurement problems, including need to show evidence of benefit
- Silos, communication problems (departments & disciplines)
- Focus on clinical revenue and research
- Conflict between care goals and learning goals
- Local level buy-in (“not invented here”)
- Lack of readiness for system-level change

Surprising Concerns

- Limitations of the Present-Day Technology/System
- There is too much focus on professionalism
- Centralization of resources and approach vs. being able to tailor it to the specific program and discipline
- Lack of time and energy for innovation, improvement and safety focus due to rotations as the organizing framework for resident education

Several proposals produced mixed reactions from attendees, with some strongly speaking in their favor and others expressing serious concern. They are shown in **Exhibit 8**.

The love-hate relationship with technology such as the electronic medical record, related to the fact that current technology is not suited to the proposed use, and electronic means may replace face to face communication. More detail is provided in the discussion of the ideas in response to design topic 4, reducing variation. In addition, four other topics in the areas of ambivalence deserve further mention: 1) concerns about limitations of the data and measurement systems and the lack of meaningful data to demonstrate the benefit of innovation; 2) conflicts between learning and care goals; 3) faculty development and development needs; 4) culture and/or the need to change the culture. A particularly interesting area of the comments related to the lack of data to show that innovation benefits relevant patient care and education outcomes, and the fact that in many settings there is an expectation for a “biomedical level of proof” and which many interventions in the learning environment are not able to meet, due to a lack of available data, small sample sizes, delayed outcomes and other complicating factors.

Data concerns also related to “measurement overload,” with multiple organizations collecting data separately, and multiple data streams existing, concerns about data validity and less than perfect efforts at analysis and sense-making. A particular focus was measurement of performance, both for residents and faculty and concerns about the validity of the existing tools, both those developed in individual sites and those applied across multiple settings with different needs. Participants emphasized the importance of developing better tools, and the need for a national effort, with the ACGME taking a role in this.

“Comments noted that web-based cases seem contrived and wasteful, when there are plenty of real patients in need of care.”

Conflict between learning and care goals produced a number of comments, with specific ideas being rated as too disruptive to a service or too questionable as a learning experience. Case-based learning at the bed side in particular was considered important, yet too time consuming to consistently do in clinical settings. Comments noted that web-based cases seem contrived and wasteful, when there are plenty of real patients in need of care. Solutions to this dilemma proposed by the participants included use of existing patients instead of developing new cases, and limiting the number of case-based learning opportunities to reduce or avoid conflict with patient care goals.

Exhibit 8

Some “Love-Hate” Relationships

- Technology, particularly the EMR, and EBM (including design problems, low utility in teaching settings and worry about electronic means replacing face to face interactions)
- Data and the availability of useful information on educational and clinical outcomes
- Culture change (Other people’s culture needs to change)
- Education vs. patient care as the priority of academic institutions
- The need to demonstrate the benefit of innovation and the lack of useful information on educational and clinical outcomes (this included concerns about the application of biomedical research “significance” standards ill-suited to education, innovation and improvement)
- ACGME Mandating Specific Approaches

Attendees expressed both support for and concern about faculty development needs and meeting these needs, with team and multi-disciplinary approaches to care, evidence-based medicine, improvement and patient safety, and systems-based practice mentioned as particular challenges, especially for older faculty. Comments also noted that faculty culture will be difficult to change, with areas of concern including unwillingness to reduce variation and a lack of commitment to the principles of evidence-based medicine. Creating attractive local programs and systems for faculty development was thought superior to external programs to educate faculty, because of the ability to tailor to local circumstances. Even with recommendations for these local systems concerns were expressed about where to find the needed time for faculty development/time and how to develop the local systems to accommodate it. Finally, participants noted that in many settings there is a need to convince faculty that continuing professional development is important and useful for them. Some comments noted that a prerequisite for faculty development is changing faculty mindset to increase interest and willingness to engage in development activities.

A series of comments related to culture and the need for culture change as part of the redesign of the learning environment. The comments noted that many of the ideas discussed during the design conference would require a major change in local culture. For the design topic related to patient safety as a system-level attribute, attendees commented that a major change required would involve overcoming the “culture of blame” that still pervades many of the settings where residents learn.

“Participants commented that new curricula and concepts are being assigned to scheduled or blocked time, instead of incorporating into the local culture.”

Participants commented that new curricula and concepts are being assigned to scheduled or blocked time, instead of incorporating into the local culture. Other comments noted that mandates for attendance or participation, including mandates by the ACGME, generally are not able to change culture. That requires a compelling case for why the new approach or system is superior for patient care and/or education. A few comments also noted that in many academic settings there is relatively little reward and positive reinforcement for efforts to change culture.

Thoughts on the Role of the ACGME in Redesigning the Learning Environment

In their comments on the design ideas, attendees were equivocal about the need for and benefit of ACGME mandates in promoting innovation in the learning environment. Many noted that ACGME and its Review Committees should play a role in fostering innovation and improvement through the accreditation process. A sizable group supported mandates as a means of speeding up implementation, particularly for ideas that required financial and other support for implementation.

Others raised concerns about the equity of mandates for participation by institutions with fewer resources, particularly safety net institutions, which may be systematically disadvantaged by mandates for costly infrastructure for resident education. Thus, unfunded mandates may eliminate good programs doing good work with fewer resources. An example is the proposal for use of the electronic medical record and computerized physician order entry, which received roughly equal numbers of red (do not implement), yellow (I have concerns), and green (go ahead) responses from attendees. The red and yellow responses focused on the suggestion that ACGME mandate be used to promote wider implementation of the EMR and CPOE in teaching settings.

The comments noted that for particular innovations, such as use of an EMR, the decision is not made by the GME leadership but by the institution, and is based on consideration and has ramifications that go beyond the effect and benefits for the educational programs. A few commented that good ideas lose their appeal when turned into mandates, but most mentioned the benefit of giving institutions and programs a choice of several tools and approaches and was mentioned widely across all the ideas developed by the attendees.

Others felt that ACGME not mandating specific approaches may represent a missed opportunity and a lack of mandates was seen by some as abrogating on the expectation that federal funds allocated to education be spent on improving resident learning and professional development. Overall, there was a lot of support for mandating broad principles, but a sizable number of comments noted that specific mandates are appropriate only when there is evidence that they will have a positive impact on relevant outcomes, such as improved resident learning or patient care quality. In addition, the comments cautioned that specific approaches and tools should be offered only to those interested, without a requirement for a particular tool or set of tools. Specifying particular tools would prevent programs and institutions from choosing the approach best for them.

In summary, attendees felt the ACGME and its Review Committees will have to decide what to give up to make time for added focus on outcomes and innovation. They strongly advocated that the new accreditation system should not just permit innovation, but actively encourage it. This may be through providing funding for innovation with the goal of increasing recognition within and for the institution.

“Accreditation “carrots” or “bonus points” could be given to programs that are using continuous improvement through continuous improvement tools like the Plan-Do-Study Act (PDSA) cycle, or a similar process to innovate and improve in their learning environment.”

Accreditation “carrots” or “bonus points” could be given to programs that are using continuous improvement through continuous improvement tools like the Plan-Do-Study Act (PDSA) cycle, or a similar process to innovate and improve in their learning environment. Many of the recommendations for a new approach to accreditation called for added flexibility for the processes used by programs and institutions and increased accountability for outcomes. Participants acknowledged that this would require more information on educational (and potentially clinical) outcomes that are presently available. In the absence of outcome data to create “equifinality” across different processes, participants commented that it may be difficult to base accreditation on practices that are specific to the given program or institution.

Patterns in Innovation in GME

There is growing interest how organizations innovate, and what constitutes practices and patterns in innovation. In their 2006 joint special report on the world's most innovative companies, Business Week and the Boston Consulting Group identified the approaches and trends in organizations that are most successful at innovation.¹ Some of the best practices at these companies include the following:

1. Open Innovation, with research and innovation laboratories that collaborate with customers, constituents and suppliers, and that also seek to tie into broader networks of researchers and experts in areas of interest to the organization.
2. An expanded role for the Chief Executive Officer as the “Innovator-in-Chief.” This gives the top official added responsibility for fostering innovation, and is needed to keep it from getting lost in the multitude of competing demands organizations face.
3. Measuring a few indices relevant to innovation that incorporate measures of benefits and risk, and that go beyond a single number such as return on investment (ROI) in innovation.

Exhibit 9

Key themes from the Design Conference

- “Point-of-Care” learning to teach Evidence-based Medicine, Patient Safety and other areas related to Systems-Based Practice (SBP) and Practice-Based Learning and Improvement (PBLI) using central computer systems or hand-held technology
- Resident portfolios as teaching tools
- Enhancing SPB and PBLI by adapting existing teaching conferences like M & M
- Electronic Medical Record (EMR) and Computer-based Physician Order Entry (CPOE) with web-based tools and decision support to reduce variation and enhance patient safety
- Multi-disciplinary approaches to care and learning
- Empower residents to develop care process solutions, improve the quality of care, and incorporating the learning into the curriculum
- Making performance data available to faculty, residents and programs to improve care and learning
- Incorporating reflection into resident learning and the improvement of clinical care
- Diminish reliance on residents for clinical services by reducing inefficiencies

4. Coordination and collaboration to bring together ideas and innovators across organizational departments, boundaries and structural barriers.
5. Gaining insight into the needs and thoughts of customers and constituents, through ethnographic studies or efforts to involve them in design that go well beyond the traditional focus group.

Adapting the practice of involving constituents in the design process, the ACGME design conference asked participants to develop concrete ideas for redesign of the learning environment in six domains. Some ideas, like “like patient care as the context for resident education,” were broad; others like “using objective definitions of the competencies to facilitate improvement in the learning environment,” were relatively narrow. Across these different domains and the range of design ideas the teams formulated, a number of “key themes” emerged across design topics, shown in **Exhibit 9**.

Three overarching concepts of the ideas for the redesign of the learning and patient care environment included use of data and technology; empowering residents to capitalize on their front-line knowledge, and making the competencies central to resident education.

Exhibit 10 identifies the key ideas in themes from a review of the literature on innovation in graduate medical education conducted as part of the ACGME Learning Innovation and Improvement Project (LIIP). This project, a component of the ACGME’s overall effort to promote innovation in the learning environment, explores innovation in the learning environment at the institution and program levels through multiple connected efforts, including an ongoing follow-up study innovative practices that were featured in the literature between 1998 and 2005. The studies included in the group to be assessed entail published articles, abstracts, summaries of presentations and information on innovation and medical education web sites. This identified the following added themes of innovation in resident education.

Even when abstracts, posters and other descriptions not in the peer-reviewed literature are included, the literature of innovation in the learning environment is not large. Reasons likely are multiple and may include some publication bias, since many innovation studies have small sample sizes and may not produce effect indices and significance levels expected by some peer reviewed publications. The relative dearth of studies on innovative interventions in graduate medical education may be due to barriers to innovation in the fairly formal institutional settings that prevail in teaching hospitals and medical schools. An analysis of innovation in schools by the Australian Association for Research in Education also is pertinent to teaching institutions and the learning environment, and draws parallels between an analysis of disincentives to product innovation in established firms due to their rigid institutional character.² It draws on an analysis by Dougherty and Heller about the problems large, established firms have in innovation of new products and services.² **Exhibit 11** shows how Dougherty and Heller’s language can be adapted to innovation in the learning environment.

Exhibit 10

Additional Key ideas in innovation in the learning environment from a review of the literature

- Simulation for procedural and team learning and to enhance patient safety
- Multi-source feedback on resident performance
- Geriatric medicine and community primary care immersion experiences
- Improvements in clinical care for defined panels of patients (e.g., ambulatory care of diabetic patients) using multi-disciplinary approaches and outcome data
- Reduced reliance on residents through hiring nurse practitioners and physician assistants
- Multi-disciplinary and collaborative approaches to inpatient rounding
- On-line curricula and teaching modules for residents
- Quality Improvement rotations and electives for residents
- Addressing the duty hour limits through changes in schedules and teaching approaches
- Responding to the science on sleep and performance through nap schedules and other alertness management strategies for residents
- Transition to practice experiences for the chief resident year
- Faculty development modules on the competencies, using video or web technology
- Communication strategies related to adverse events, including reporting and disclosure

Dougherty and Heller identified three types of linkages required for effective innovation, which can be adapted to resident education and the learning environment: 1) links between market and environmental needs and technological possibilities for design or redesign of the learning environment; 2) links between the expertise residing in different functions within the organization; and 3) links between the innovative practice and the organization's mission, goals and resources.³ Making these links in established firms (or residency programs and sponsoring institutions) is difficult because they may be seen as conflicting with the institutional practices that characterize the organization.⁴ For innovation in the learning environment to succeed these link are vital, because they engage users in the innovation process and allow innovative ideas to make it to implementation.

¹ The World's Most Innovative Companies. Results of the BCG/Business Week Survey. Business Week Online. April 26, 2006, Retrieved March 23, 2007, from Business Source Premier Database.

² Effective implementation of new technologies: Legitimising change strategies in schools Julianne Lynch, Latrobe University, Australian Association for Research in Education, <http://www.aare.edu.au/00pap/lyn00220.htm>, Accessed March 23, 2007.

³ Dougherty, D., & Heller, T. (1994). The illegitimacy of successful product innovation in established firms. *Organizational Science*, 5(2), 200-218.

⁴ Ibid.

Exhibit 11

Terminology of product innovation adapted for the learning environment*

Dougherty and Heller's language

New product innovation

Market

Different functions within the firm

Firm's strategy and resources

Equivalent in the learning environment

Innovation in teaching and learning technology, defined as a set of practices designed to meet particular learning goals

Learners and teachers and the public

Different:

- Learners and teachers
- Disciplines
- Aspects of learning, including the competencies
- Modes of delivery

Program's and/or sponsoring institution's strategy and resources
Wider policy, accreditation and funding environment

* Adapted from Lynch J. Effective implementation of new technologies: Legitimising change strategies in schools. Australian Association for Research in Education, <http://www.aare.edu.au/00pap/lyn00220.htm>, Accessed March 23, 2007, and Dougherty D, Heller T. (1994). The illegitimacy of successful product innovation in established firms. *Organizational Science*, 5(2), 200-218.

Second ACGME Design Conference to Address Change Management

The ACGME is organizing a second design conference, on the topic of managing change, to be held September 8 and 9, 2007 in Rosemont, IL. This represents a continuation of the ACGME's effort to contribute to the design the future learning environment. The topic – change management – is in direct response to the complexity and challenge of change emerging as a major theme from the first design conference. Much of the writing on innovation addresses individual and organizational barriers to change, including the lack of linkages in established settings described by Dougherty and Heller, and the barriers to participants in the first ACGME design conference identified during the exercise using the Keegan and Lahey matrix.

Like the first design conference, the planned conference on change management will allow program directors, designated institutional officials, faculty, ACGME review committee members, and others with a stake in graduate medical education the opportunity to learn best practices for managing change in the learning environment for adoption and adaptation in programs, sponsoring institutions and the work of the review committees.

Design sessions will allow attendees to discuss practical approaches for managing change and formulate concrete ideas for how to make changes in the learning environment that promote improvement and innovation. Working design sessions will address change as a component of daily work and a key role for individuals in medical education; managing and communicating change throughout the organization; use of a “Campaign Model” for promote and manage change; and sharing and mining individuals’ stories about change from the frontlines of resident education.

The working sessions will be interspaced with lectures by notable speakers on managing change. This includes a panel entitled *How the World is Changed*, featuring the co-authors of the book “Getting to Maybe,” Brenda Zimmerman, PhD, Schulich School of Business, York University, Canada; Frances Westley, PhD, Desautel Faculty of Management, McGill University; Michael Quinn Patton, PhD, University of Wisconsin and Past President of the American Evaluation Association. It also includes presentations on involving staff from the front lines to the institution’s leadership in managing change; a panel entitled *Success Stories in Managing Change and Improvement*, featuring institutions participating in the pilot of the Learning Improvement and Innovation Pilot Project; a presentation on how to apply the Institute for Healthcare Improvement’s campaign model to promote change; and a session on the use of in situ simulation as a tool for promoting change in the clinical and learning environment.

The outcome of the conference will be a set of proceedings that will contribute to the ACGME’s ongoing effort to promote innovation and change with the goal of improving the learning environment for residents. ■

Review Committee Column

ACGME approves revised Common Program Requirements and Institutional Requirements and to the Program Requirements in a number of specialties

At the meeting in February 2007, the ACGME approved revisions to the Common Requirements. An important aspect of this revision is the inclusion of more detailed language on the General Competencies within the text of the Common Program requirements. The Common Program Requirements will become effective July 1, 2007, and will be accompanied by a revised “common Program Information Form (PIF).” Additional information will be shared with program directors and DIOs via electric mail and the ACGME-Bulletin.

At its September 2006 meeting, the ACGME approved revisions to the Program Requirements for Psychiatry, Child and Adolescent Psychiatry, Pediatric Surgery (a subspecialty of Surgery) and those for two subspecialties of Pediatrics, Pediatric Critical Care Medicine and Neonatal/Perinatal Medicine. All revisions will become effective July 1, 2007.

At the February 2007 meeting, the ACGME approved revisions to the Program Requirements for Allergy and Immunology, Dermatology, the General Requirements for Emergency Medicine subspecialties, Pediatric Emergency Medicine (as a subspecialty of both Emergency Medicine and Pediatrics), Medical Genetics, Molecular Genetic Pathology, Pathology, Diagnostic Radiology and Neuroradiology. The revised requirements will take effect July 1, 2007, except for the requirements for Diagnostic Radiology, which will take effect on July 1, 2008. The Board also approved program requirements for a new subspecialty, Medical Biochemical Genetics. The program requirements for this subspecialty became effective February 13, 2007.

At both the September 2006 and February 2007 meetings, the Committee on Program Requirements also discussed refinements to its conflict of interest policy and the template for the impact statement that is required for each program requirements revision. At the February meeting, the Committee’s chair, Ed Bope, MD, reported that the committee also is deliberating on the program requirements for specialties that allow multiple educational formats within the specialty, and that the implications on the program requirements, the program information form, and the interface pages for the Accreditation Data System (ADS) merit further discussion.

Other News from the ACGME Meeting

ACGME honors 2007 recipients of the John C. Gienapp Award, and the Parker Palmer Courage to Teach and Courage to Lead Awards

At the February 2007 meeting the ACGME honored Paul B. Batalden, MD, as the seventh outstanding contributor to improving resident education to receive the John C. Gienapp Award. Dr. Batalden is a professor of pediatrics in the Department of Community and Family

Medicine at Dartmouth Medical School, and program director of the Dartmouth-Hitchcock Preventive Medicine Residency Program at the Dartmouth-Hitchcock Medical Center. He serves as Director of Health Care Improvement Leadership Development at the Center for the Evaluative Clinical Sciences of the Dartmouth Medical School.

Dr. Batalden was founding chair of the Board of the Institute for Healthcare Improvement and continues to serve as the Institute's Senior Vice President for Health Professional Development. He serves as Director of Health Care Improvement Leadership Development at the Center for the Evaluative Clinical Sciences of the Dartmouth Medical School.

Past recipients of the John C. Gienapp Award have included Jordan Cohen, MD, Alvin LeBlanc, MD, William Williams, MD, Paul Friedmann, MD, Ronald Berggren, MD, and David Glass, MD.

The three recipients of the 2007 Courage to Lead Award, which is given in recognition for outstanding achievement by a Designated Institutional Official (DIO), are:

Robert C. Cefalo, MD, Ph.D.

University of North Carolina Health Care System,
Chapel Hill

John L. Weinerth, MD

Duke University Hospital

Debra F. Weinstein, MD

Brigham and Women's Hospital
Massachusetts General Hospital

Ten individuals received the 2007 Courage to Teach Award, given in recognition for exemplary service as a program director. They are:

David B. Allen, MD

University of Wisconsin Children's Hospital
and Clinic Pediatrics

Hasan Bazari, MD

Massachusetts General Hospital
Internal Medicine

Gary S. Clark, MD

Case Western Reserve University/MetroHealth
Medical Center
Physical Medicine and Rehabilitation

Carey D. Chisholm, MD

Emergency Medicine
Indiana University

Javier Alfonso Gonzalez-del-Rey, MD

Cincinnati Children's Hospital
Pediatrics

Roberto C. Heros, MD

University of Miami
Neurological Surgery

Neil C. Mitnick, DO

Albany Medical Center
Family Medicine

Humberto Quintana, MD

Louisiana State University Health Sciences Center,
New Orleans
Child and Adolescent Psychiatry

Allen Silbergleit, MD

St. Joseph Mercy Oakland
General Surgery

Jeffrey G. Wiese, MD

Tulane University School of Medicine
Internal Medicine

Election of officers and committee members

At its September 2006 meeting, the ACGME Board of Directors elected new officers: William H. Hartmann, MD as Chair; Susan Day, MD as Vice-Chair; Mr. Roger Plummer to the office of Treasurer; and Mr. Mark Laret; Mr. Paul Gardent; and Melissa Thomas, MD as at-large members of the Executive Committee. The Board also approved the reappointments of Edward T. Bope, MD for an additional three-year term ending in September 2009, and of one of its public members, Mr. Michael Klowden, for an additional two-year term ending September 2008.

Louis Cantor, MD and Carol Carraccio, MD were elected Chair and Vice Chair of Council of Review Committee Chairs. The ACGME also approved a change in the bylaws that will allow the Chair of the Council of Review Committee Chairs to participate in the Executive Committee Meetings without vote. The ACGME also recognized outgoing directors and committee members.

ACGME engages in internal review of the organization

To enhance service of the ACGME's Mission, Vision, Values, and Strategic Priorities, the ACGME is undergoing an internal review. At the September 2006 meeting, the Council appointed and charged an Internal Review Committee. The internal review process will be accomplished with the assistance of two external consultants, and involves interviews, surveys and other data gathering activities. This information will be the focus of a facilitated retreat at the June 2007 ACGME meeting. A final report is expected at the September 2007 ACGME meeting.

Strategic Initiatives Committee Discusses Patient-Centered Care

At its September 2006 and February 2007 meetings, the Strategic Initiatives Committee focused on Patient Centered Care and viewed a video on Patient and Family Centered Care at the Medical College of Georgia from the PBS series entitled *Remaking American Medicine*. At the February 2007 meeting, Patricia Sodomka, FACHE, Senior Vice President, Patient and Family Centered Care at the Medical College of Georgia, and the Director of the organization's Patient and Family Centered Care initiative, presented to the Committee, and engaged the group in an in-depth discussion of patient-centered care in a

teaching hospital setting. In addition, the committee reviewed a paper entitled *Patient Centered Care and the Joint Commission*, authored by Paul Schyve, MD, Joint Commission on the Accreditation of Healthcare Organizations. The committee discussed interest in linking the ACGME/ABMS general competencies and the Institute of Medicine (IOM) aims for the health care system, as is done in the “Vanderbilt Matrix,”¹ and supported efforts to share best practices in a way to support patient care and energize residents.

At the February 2007, Paul Batalden, MD, Director of Health Care Improvement Leadership Development at the Center for the Evaluative Clinical Sciences at Dartmouth Medical School, gave a presentation on the systems implications of patient-centered care.

The Committee discussed ways in which the ACGME could promote patient-centered care in teaching settings and as a component of residents’ education and professional formation. Plans include the formation of an Advisory Group, with representation from the ACGME’s five member organizations, the JCAHO and the Institute for Healthcare Improvement (IHI). This group will be charged to a proposal for a symposium on patient-centered care in an academic medicine context, to be co-sponsored by the ACGME and its member organizations, as well as a broader discussion paper for the implications of patient-centered care for teaching institutions and for the accreditation process.

¹ Bingham JW, Quinn DC, Richardson MG, Miles PV, Gabbe SG. Using a healthcare matrix to assess patient care in terms of aims for improvement and core competencies. *Jt Comm J Qual Patient Saf.* 2005 Feb;31(2):98-105.

Council of Review Committee Chairs discusses hour standards, experience to date

At both the September 2007 and February 2007 ACGME meetings, the Council of Review Committee Chairs discussed the common duty hour standards, with a particular focus on the 24 + 6 hour limit on continuous duty; the required rest period between duty shifts; and the 10% exception. One idea discussed entailed a more global exception for chief residents in some surgical specialties to allow the final year of their education to more closely resemble their experience and hours in practice.

At the February 2007 meeting, ACGME staff conducted a duty hour “Think Aloud” exercise with the members of the Council, as part of a larger effort by the Committee on Innovation in the Learning Environment to assess the effect of the common duty hour standards in patient care, resident learning and resident safety and well-being. Individual follow-up with the RC chairs for a number of specialties is planned, to probe in more detail their experience with the common duty hour standards.

ACGME Adopts Report of the Competency-Based Portfolio Committee

At the February meeting, the ACGME accepted the final recommendations in its ad hoc Competency Based Portfolio committee, and authorized report with the understanding that the Board would review and re-endorse the project before and after alpha and beta testing and before its final implementation.

The Board’s endorsement allows the ACGME to move forward with this project, which entails development and in-depth testing of an electronic portfolio system for residents. Plans call for making the electronic portfolio available to programs by 2009.

The Council of Review Committee chairs also discussed and conducted a small group exercise on the resident learning portfolio, with particular focus on how the portfolio might be organized.

In Memoriam: Richard A. Gleckman, MD

Richard Gleckman, MD, an Accreditation Field Representative for the ACGME, died in February of cancer at his home in Worcester, Massachusetts. Dr. Gleckman, an infectious disease specialist in academic practice prior to joining the ACGME in 2001, was deeply committed to improving residency education through accreditation, and after being diagnosed wanted to continue his work on the ACGME field staff as long as his condition allowed. He was able to conduct site visits until the last weeks of 2006. A report from one of the last programs he had completed in late November was lost in the transfer to the ACGME, and his wife Brenda mailed a copy to the office. In a sad and touching twist, the document arrived the day after the notice of this death reached the ACGME.

Dr. Gleckman is survived by his wife Brenda, three children and six grandchildren. An obituary quoted Dr. Gleckman as saying, “...I felt fortunate to have had the opportunity to care for patients, lecture internationally, contribute to medical literature, and teach generations of physicians.” He will be missed by his ACGME Colleagues.

Two new Accreditation Representatives join the ACGME Field Staff

John Coyle, MD, and J. David Marler, PhD, joined the ACGME field staff in January 2007. Dr. Coyle is an academic surgeon at the Chicago Veterans Affairs Hospital and the McGaw Medical Center of Northwestern University Hospital. He received his medical degrees from Loyola University Stritch School of Medicine, Chicago, and completed residency education in surgery at the University of Minnesota Hospitals, and also received a Masters of Business Administration from Kellogg Graduate School of Business, Northwestern University.

Dr. David Marler most recently served as the Director of Medical Education at Providence Hospital and Medical Centers, Southfield, Michigan. His educational background include a Master of Education from Mississippi State University, and a PhD in Administration of Higher Education from Michigan State University.

The Value of Residents to the Development of Junior Faculty

Adam Dimitrov, MD

I believe you learn as much in your first year as an attending than you do during your intern year. The learning curve is somewhat different in its characteristics, but the trajectory just as steep.

Uncertainty boasts a certain humility that keeps one's confidence in check. One can graduate from residency "highly proficient" in the six competencies, only to find oneself the next week as the least experienced physician amongst his colleagues...perhaps by as much as 20 years. It can be difficult to resist the urge to second-guess yourself when a colleague holds a different opinion from your own. It truly is a challenge to navigate the gray areas of medicine in which more than one correct answer may exist.

I joined the faculty of the residency program in which I had trained a month after graduation. Though honored and excited, I had some reservations about this decision. Would I have anything to offer? Would I be an effective teacher? Did I have enough clinical experience to gain the respect of the residents and my colleagues? I was fortunate to run into junior faculty from other residency programs who had entered into academics right out of residency and who had shared similar concerns. They each had the same advice: "The key is to find yourself some mentors." So I did.

"I was blessed with a diverse group within my own faculty to whom I could confide, specifically those who themselves were not long out of residency. I quickly learned that collaboration and the sharing of ideas make faculty-life very rewarding."

I connected with inspiring individuals from national academic societies. I sent some of my work to faculty in other institutions for review. I was blessed with a diverse group within my own faculty to whom I could confide, specifically those who themselves were not long out of residency. I quickly learned that collaboration and the sharing of ideas make faculty-life very rewarding.

As my first year progressed, I was surprised about the group whose members would turn out to be my greatest teachers: the residents I was supposed to be teaching. I would joke with them that I hoped that they were learning from me. I sure was learning a lot from them.

The residents, especially those in their third-year, challenged me on a daily basis. Their clinical questions made me look at various topics from different angles I may have previously omitted as a resident myself. I quickly learned that "I'm not sure" is a valid response for both a resident and an attending, and that the journey of searching for answers may be as rewarding as the destination. I soon realized that the aim of medical education should not be to fill young minds with endless information, but rather to create life-long learners.

"Faculty development must remain the focus of any academic physician, whether junior or senior."

Most of all, I appreciated the honest feedback granted to me by the residents. Perhaps they felt more comfortable giving me feedback, compared to other attending physicians since I had been one of them the year before. They informed me when I had provided them good leadership and instruction; they also let me know when I had not met their expectations. I made it a point to sit down and give them feedback in return for comments on how I could also improve.

As my first year on faculty came to an end, I was honored in being awarded the department's Faculty Teaching Award. I had many people to thank, including my fellow faculty members and outside mentors. However, my greatest teachers were those residents who had shared this experience with me.

Faculty development must remain the focus of any academic physician, whether junior or senior. Though we should rely on mentoring and collaboration amongst each other, we must not underestimate the powerful role that residents can play in this process. ■

Adam Dimitrov, MD is the Director of Undergraduate Clinical Education in the Department of Family Medicine, Franklin Square Hospital Center.

Work Hours and Hours of Sleep as Predictors of Sources of Learning in Residency: Data from a National, Multi-Specialty Survey

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

Method

To examine the effects of reported work and sleep hours on residents' sources of learning, data from a large national, multi-specialty survey of first- and second-year residents conducted in 1999 were re-examined to look at the relationship between resident work hours and sleep and their reported sources of learning.

First and second year residents (n=3,604) completed surveys about their residency experience (64.2% response rate). For the survey period, which predates the 2003 implementation of the ACGME common duty hour standards, residents across all specialties reported averaging 79.4 hours (std.=19.2 hours) of work per week and 41.1 hours (std.=6.6 hours) of sleep per week. Sleep averaged 5.9 hours per night.

“Lower work hours and more sleep are associated with learning more from faculty-organized and self-directed activities, while more work hours and less sleep is associated with more peer-oriented learning, and less learning from faculty-organized and self-directed activities.” Participants commented that new curricula and concepts are being assigned to scheduled or blocked time, instead of incorporating into the local culture.”

Results

For this analysis, residents were classified as averaging less or more than 80 duty hours per week, and averaging less or more than 41 hours of sleep per week. Taken together, this classification produced four groups:

1. Lower work hours, more sleep (n=1,247);
2. Lower work hours, less sleep (n=774);
3. More work hours, more sleep (n=489); and
4. More work hours, less sleep (n=959).

As part of the survey, residents also rated the importance of each of 11 common sources of learning on a scale of 1 (not at all) to 5 (a great deal). Factor analysis reduced these 11 sources into three more general sources or modes of learning: Faculty-organized, Peer-oriented, and Self-directed.

Analysis of these three factors using 2 X 2 ANOVA showed significant main effect differences for both work and sleep hours (p<.001). No interaction terms were statistically significant. The factor scores shown in **Exhibit 1** should be interpreted as variation around the grand mean of the sample.

Discussion

The combination of work and sleep hours together provides a better picture of residents' learning experiences than either one alone: lower work hours and more sleep are associated with learning more from faculty-organized and self-directed activities, while more work hours and less sleep is associated with more peer-oriented learning, and less learning from faculty-organized and self-directed activities. This study suggests that residents feel they are less able to take advantage of the educational opportunities provided by faculty and by self-learning under conditions of greater work hours and less sleep. Our data suggest that longer work hours may be partially offset by increased sleep time, while shorter work hours are needed to compensate for inadequate sleep time. ■

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.

Exhibit 1:

Relationship of Reported Average Work and Sleep Hours with Sources of Learning

	Sources of Learning		
	Faculty-organized	Peer-oriented	Self-directed
Less work/More sleep	+0.17	-0.16	+0.07
Less work/Less sleep	+0.04	.00	+0.09
More work/More sleep	-0.04	+0.09	-0.01
More work/Less sleep	-0.23	+0.15	-0.16

Walking with a Flashlight: The First Report of the Committee on Innovation in the Learning Environment

Ingrid Philibert

"Take small concrete steps the purpose of which may be only to illuminate the next step." – Dee Hock

Educators and physicians who have worked in their local setting to enhance resident learning and engagement in patient care, and to the members of the Committee on Innovation in the Learning Environment (CILE), may see Dee Hock's quotation as a fitting analogy for efforts to redesign the learning environment. Their efforts, which are focused at the local and operational level, differ from the equally important recommendations for sweeping national changes in the education of physicians and other health professionals emerging this year from expert panels and major organizations in medical education.

In February, CILE released its draft first report, aimed at advancing innovation and improvement in programs and institutions. In keeping with the ACGME's role as an accrediting organization, the report approaches innovation in the context of accreditation and associated activities, including 1) identifying and sharing notable practices with programs and sponsoring institutions; 2) promoting dialogue and collaboration among organizations in medical and health professions education; and 3) engineering thoughtful change in the accreditation standards and processes to promote creativity in resident and fellow education and in the accreditation process to achieve high-quality learning and patient care. The effort also is closely aligned with several of the ACGME's strategic priorities, particularly 1) promoting innovation in the learning environment; 2) enhancing use of educational outcomes; and 3) reducing burden in accreditation.

The report can be found on the ACGME web site (<http://www.acgme.org/acWebsite/home/CILE.FirstReport.FinalDraft.022407.pdf>). Currently, the report is undergoing broad review by the medical education community, with the ACGME welcoming stakeholder comments. Comments will be accepted through May 10, and the report will be finalized at the June 2007 ACGME meeting. The report is organized around five concepts:

Describing innovation and improvement in the learning environment, to learn from institutions that succeed at innovation and improvement that meets the dual objectives of high-quality patient care, resident learning and professional development.

Using accreditation to stimulate program and institutional innovation, to enhance the ability of the accreditation process to promote innovation in the learning environment.

Integrating care delivery and clinical education to advance a focus in physician education on the current priorities in patient care and quality improvement and an understanding of how programs and institutions apply and adapt innovative approaches in these areas.

Collecting and disseminating information on "innovative practices" to assist programs and institutions in making changes in their learning environment.

Broadening input into the redesign of the learning environment through collaboration, to stimulate collaboration among multiple organizations with a stake in graduate medical education.

Focus on institutions that succeed in innovation in the learning environment

To explore common attributes of institutions that succeed in innovation in the learning environment, the ACGME's Learning Innovation and Improvement Project (LIIP) seeks to gather ground-level observations on institutions that succeed in innovation, and the factors that facilitate the spread of innovation in the learning environment and disseminate it

"LIIP is working with four pilot sites that have published on institutional and program level innovation and improvement and have demonstrated excellent accreditation performance at the program and institutional level."

for adoption and adaptation. LIIP is working with four pilot sites that have published on institutional and program level innovation and improvement and have demonstrated excellent accreditation performance at the program and institutional level. These institutions have agreed to work with the ACGME in a data collection approach that entails telephone interviews and on-site visit. The pilot institutions also agreed to provide feedback to refine the LIIP approach application to a larger group of sponsoring institutions. In addition, CILE is conducting a follow-up study on what happened to innovative approaches described in the literature between 1998 and 2005, and a series of focus groups with residents and program directors on their expectations and experience with innovation in the learning environment.

Assessing the effect of changes in the learning environment

A related effort is the ACGME's study of innovation in the accreditation standards and processes through ACGME-supported accreditation pilots. RCs may select from among these supported options those pilots that best allow them to meet their specific goals. The ACGME also is committed

to promote change in the learning environment through responses to an ACGME Request for Proposals (RFP), open to programs and institutions in good standing with the ACGME. Innovations that could be tested through pilots and the RFP include shortened program information forms, extended review cycles, validated tools for the six general competencies, learning portfolios, simulation and rehearsal and other innovative approaches. The pilots could also be used to create temporary exemptions from certain standards and/or a collaboration between the RC and programs similar to the Internal Medicine RC's Educational Innovation Project.

The ACGME has begun a comprehensive effort to assess the effect of the common work hour standards on patient care, resident learning and resident well-being, through a combination of its own studies and review of other high-quality studies that have explored the relationship between the duty hour standards and resident learning and engagement in clinical care. It includes focus group and surveys of the Council of Review Committee Chairs and the individual RCs. The results of this effort will assist in identifying ways to adapt education to the new models of patient care delivery and learning, and provide a scientific foundation for any potential future refinement to the standards by testing them through the use of the RC pilots and the RFP process.

Promoting change in the learning environment through dissemination and collaboration

An important element of the work of CILE is to facilitate the dissemination and early adoption of innovative ways to redesign and improve the learning environment, to better prepare residents for practice in the 21st century. Focal areas include simulation and rehearsal; improved teaching of hand-offs and other approaches for maintaining continuity of care under team- and shift-based approaches to care; enhanced teaching and practice in ambulatory management for patients with chronic health conditions, including use of data to improve ambulatory care for defined patient populations; and use of human factors and systems engineering in the resident learning environment.

“Rogers classifies 15 percent as early adopters, making them a second group important to changing practices through innovation.”

A major focus is on dissemination, because true innovation likely is confined to a few programs and institutions. Everett Rogers estimated that no more than 3 percent of individuals and institutions are true innovators.¹ Rogers classifies 15 percent as early adopters, making them a second group important to changing practices through innovation.² Early adopters gain further in importance because several studies in the health care setting have replicated Rogers' finding that individuals rely on information gained from their interactions

with colleagues much more than on research reports, or even institutional policy and procedure changes, to update their practice.³ In addition, true innovators often are independent inventors and entrepreneurs, while large established organizations, such as most teaching institutions, focus on the implementation and refinement of innovative practices, to assist with the spread of innovation.⁴ Some ideas in CILE's first report are not new, but constitute validated practice in many non-teaching settings, such as efforts to improve the ambulatory care of individuals with chronic health conditions. At the same time, these ideas are not established

“Rogers noted that it may be the “perceived,” not the actual, novelty of an idea that produces reaction and reluctance to adopt.”

practice in most teaching institutions. In his study of the diffusion of innovation, Rogers noted that it may be the “perceived,” not the actual, novelty of an idea that produces reaction and reluctance to adopt.⁵ What is needed to move them toward implementation is convincing information from early adopters that highlights the benefits of the new approach.

CILE's efforts to promote both innovation and the spread of innovative practices to a larger group of programs and institutions will unfold over the coming 24 months. In its continued process of “walking with a flashlight,” CILE and the ACGME welcome input from stakeholders. While final approval of the report will not occur until June, the endorsement of the concepts that occurred at the February ACGME meeting allowed aspects of the work, such as exploration of the patient care and learning effects of the common duty hour standards to commence. Other elements of the recommendations, such as the Review Committee pilots and the Requests for Proposals (RFP) for programs and institutions will be implemented after June.

The efforts by CILE, and the work underway in a number of Review Committees to promote innovation and improvement through accreditation (such as the Educational Innovation Project (EIP) in Internal Medicine complement each other, and also complement the initiatives underway within the American Medical Association and the Association of American Medical Colleges to conduct a broader examination of the changes needed to advance physician education for practice in the 21st Century. ■

¹ *Rogers, E. M.* (2003). *Diffusion of Innovation*, Fifth Edition. New York, NY: Free Press.

² *Ibid.*

³ Gerrish K Promoting evidence-based practice: an organizational approach *J Nurs Manag.* 2004 Mar;12(2):114-23.

⁴ Baumol, W. J., "Education for Innovation: Entrepreneurial Breakthroughs vs. Corporate Incremental Improvements" (June 2004). NBER Working Paper No. W10578. Available at SSRN: <http://ssrn.com/abstract=559228>

⁵ *Rogers, E. M.*, 2003.

Editor's Introduction

A "Design Conference" As A Way to Broaden Input into the Redesign of the Learning Environment

The Case for Redesign of GME

D. C. Leach, MD

2007 John C. Gienapp Award Address: Inviting the Grace of the Great Thing

P. B. Batalden, MD

2006 Design Conference on the Learning Environment

Keynote address: From Novice to Expert

H. Dreyfus, PhD

Proceedings from the First ACGME Design Conference on the Learning Environment

I. Philibert

Constituents and the Redesign of the Learning Environment: The Process

Involving Constituents in the Redesign of the Learning Environment: The Results

Patterns in Innovation in GME

Review Committee Column

Other News from the ACGME Meeting

The Value of Residents to the Development of Junior Faculty

In Brief

Work Hours and Hours of Sleep as Predictors of Sources of Learning in Residency: Data from a National, Multi-Specialty Survey

D. C. Baldwin, Jr., MD, S. R. Daugherty, PhD

Editor's Occasional Column

Walking with a Flashlight: The First Report of the Committee on Innovation in the Learning Environment

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