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ACGME

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EDITOR'S INTRODUCTION

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

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New Models of Care, New Models of Learning

In late 2004 the ACGME formed the Committee on Innovation in the Learning Environment (CILE), with the goal of promoting innovation through the accreditation process. This summer, CILE released its first formal report. At a fundamental level, the report pays homage to the concept that innovation and improvement are local phenomena, and that fostering both involves clarifying goals and directions and removing obstacles, including obstacles presented by the accreditation standards and processes.

The idea of local-level innovation, and the roles that are played by accreditors, medical education organizations, the larger community, and other experts is the theme of this issue of the *ACGME Bulletin*. In his column, Dr. Leach likens

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innovation to the destruction of idols. This highlights the local nature of the concept (and hints at the danger of viewing innovation as the destruction of idols other than one's own). Drs. Hamman and Rutherford's article describes *In-Situ* simulation as a means to identify and capitalize on opportunities for improvement in team-based care, in ways that are deeply sensitive to local circumstances and needs. Four articles from internal medicine programs participating in both the Internal Medicine Review Committee's EIP Project and the Association of American Medical Colleges Academic Chronic Care Collaborative describe their initiatives and how they respond to common and local circumstances in the process of changing education and practice. In keeping with an ambulatory theme, Robert McDonald and colleagues offer a model for assessing the general competencies in ambulatory settings.

The article by Callahan and others suggests ways to elevate the internal review process from an exercise in accreditation compliance to a tool for meaningful improvement of the type an institution would undertake if there was no ACGME requirement. David Capobianco and Henry Schultz propose an adaptation of the

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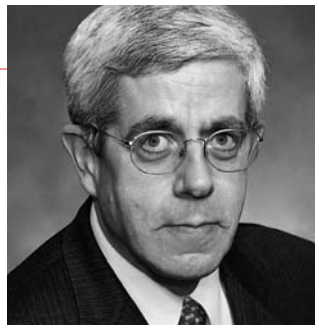
general competencies to better define the professional skills set and obligations of program directors, with the goal of enhancing program leadership and oversight.

The American Board of Medical Specialties (ABMS) web-based patient safety modules described by Julie Mohr are useful tools for residents and faculty physicians to expand their practical knowledge about patient safety. At the end of the issue, the Editor's occasional column begins the work of developing a taxonomy of approaches to innovation in the learning environment to advance a larger dialogue and, it is hoped, many local level conversations about change and improvement in resident education.

"…rather than imitating mentors or best practices from other sites blindly, other individuals or institutions need to adapt these models to their situation and context, which likely is different."

The importance of sensitivity to local needs and contexts emerges throughout the articles in this issue. It is illustrated in Dr. Leach's statement, "We should not follow our mentors; we should follow what our mentors were following." It suggests that rather than imitating mentors or best practices from other sites blindly, other individuals or institutions need to adapt these models to their situation and context, which likely is different. We hope the articles in this issue will stimulate additional thoughts about innovation, adoption and adaptation at the local level. ■



A Midrash

David C. Leach, MD

An alleged midrash

It is said that Abraham's father was an idol-maker and that Abraham, as a young man, worked in his father's shop. One day he became angry with a customer and said something to the effect of:

> *„Certainly you see how foolish this is. You see the wood come in, you see my father and I carve it and then you take it home and worship it. It should not be worshipped; it is just wood."*

With that his anger increased and he started a fire into which he threw all the idols he could find. His brother Haran helped him. Eventually the police of the day showed up and said: "You can't do that. We will throw you into the fire." Then Abraham said something profound, he said: "You are right, if I am going to destroy idols I have to start with myself. Throw me into the fire." They did, but he did not burn up, instead he was quite comfortable. His brother, more of an opportunist, melded into the crowd when the police came; but when he saw that nothing bad happened to Abraham he stepped forward and said: "I was throwing idols into the fire as well." The police threw him into the fire and he died.

What does this midrash have to do with *New Models of Care, New Models of Learning?* I would submit that it has everything to do with it. It is said that people resist change; my own experience is that people are attractedto change. People want to understand the truth, to help patients and residents, and most of all to do something creative and even beautiful. Transitions are hard, but change is not. Getting from here to there is hard, but upon arrival life can be better than ever. So, how do we overcome the inertia offered by the transition and create a future that is faithful to our values and offers effective GME to residents as well as first rate care to patients? It begins by sorting out our idols, by critically reviewing our habits, assumptions, conceptual constructs and by realizing that "if I am going to destroy idols I have to start with myself."

"So, how do we overcome the inertia offered by the transition and create a future that is faithful to our values and offers effective GME to residents as well as first rate care to patients?

ACGME is committed to fostering improvement and innovation in the learning environment. We have our own idols that we are trying to dismantle. Program requirements grow uncontrollably if left untended. As Review Committees encounter marginal or even bad programs they create requirements to prevent bad behavior – and the roughly 92% of programs in good standing with us must comply along with the 8% for whom these requirements are targeted.

Our first idol: all programs must meet the same standards. This is a fundamental tenet of accreditation. In creating its Educational Innovations Project (EIP), the Internal Medicine Review Committee threw that idol on the fire and the light and warmth provided has inspired other Review Committees to take a similar approach.

Our second idol: accreditation is a trailing edge phenomenon and should not be used to foster innovation. The Committee on Innovation in the Learning Environment is currently warmed by the fires from that idol. As ACGME developed its strategic plan it made the conscious and exciting commitment to foster improvement not only by forcing the 8% to improve but by enabling the 92% to unleash their talent and energies for the work of improving GME. RRC pilots, strengthening institutional review, approaches using

"Our second idol: accreditation is a trailing edge phenomenon and should not be used to foster innovation."

developmental assessment, conferences aimed at stakeholder input in the redesign of the learning environment; the Learning Improvement and Innovation Project (LIIP) pilot and others are responses to this priority and have placed ACGME into new territory. It is exciting. We don't have it right yet, but we are learning and are deeply grateful for the community of engaged and enthusiastic participants that are learning with us, some of whom report their work in this issue of the Bulletin.

Our third idol: resident learning begins with goals and objectives. This idol appeared as we were designing the ACGME Learning Portfolio. Goals and objectives invite us into the mental constructs housing other idols. They are important but can't trump the reality that resident learning begins with experience, frequently experience that begins in gross uncertainty and ambiguity. The educational task is to develop the skills needed to define reality with sufficient clarity to make decisions. After the fact it is possible to reflect on lessons learned, but not out of the gate. Resident learning begins with the announcement of a new admission, or a consult to be seen, or news that you have to present at the Morbidity and Mortality Conference. Thus the ACGME portfolio is designed to begin with a drop down list of

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experiences and goes from there to assessment. The assessments can map to particular goals and objectives but the portfolio acknowledges the reality of the resident's day and begins with experience rather than a list of the competencies. A few brave programs began to use the portfolio in July and will alpha test it for a year. Beta testing will begin in 2008.

Our fourth idol: ACGME is most effective when its deliberations are confidential. We are still worshipping this idol. Cogent arguments can be made that we are most effective when we communicate with programs directly and in confidence. Yet the larger societal forces calling for transparency remain and are growing. Medical students, residents, faculty and the public want to know not only the actions taken but the citations issued, the detailed results of our investigation. We have seen the powerful effect for good that occurs when patient outcomes are posted on hospital websites. My own view is that we need to be more transparent; we just have to figure out how to do it right and then another idol can be thrown on the fire. ACGME has other idols. I'm sure you can think of scores. A recent retreat of the ACGME Board and the Chairs of the Review Committees done as part of our own internal review (and which will be reported elsewhere) revealed many idols to be lined up for fuel. Organizations must change; relevance and fidelity demand it.

Teaching is autobiographical. We teach what we have learned; we also tend to teach in the same manner in which we were taught. The truth, however, is bigger than we have learned. With advances in medical knowledge, in technology,

"We should not follow our mentors; we should follow what our mentors were following."

in educational theory and technique our understanding of what it takes to be an authentic physician (and an authentic profession) has changed. We should not follow our mentors; we should follow what our mentors were following. We should not necessarily do what they did; rather do what they would do if they faced our circumstances. Wooden idols are not useful any longer. ■

How Healthy Are Health Care Teams? System Diagnostics Through *In-Situ Simulation®*

Captain William Hamman, MD, PhD
Captain William L. Rutherford, MD

The Center of Excellence for Human Performance and Simulation Research has just finished the first year of our three-year research grant to apply simulation processes from the air carrier industry to health care. This research effort focuses on identifying the fundamental mechanisms, systems, and behaviors that enhance health care team performance, by using the philosophy of the Advanced Qualification Program (AQP). Our AQP-derived *In-Situ Simulation®* approach has been specifically designed to train, assess, and debrief the performance of health care teams in complex, dynamic settings – not in artificial laboratory environments.

"This research effort focuses on identifying the fundamental mechanisms, systems, and behaviors that enhance health care team performance, by using the philosophy of the Advanced Qualification Program (AQP) in commercial aviation."

Just as aviation-based models of teamwork skills cannot be directly translated from the United States to other nationalities,[1] so should health care providers refrain from direct translations of aviation-based models of safety to health care.[2] That being said, many of the *processes* that the aviation industry has developed to maximize human performance (such as AQP) can be used successfully in health care.

Errors that compromise patient safety can be tied to latent failures embedded in the structure and function of the overall health care system.[3] For example, multi-disciplinary teams deliver most care today, yet health care organizations often remain focused on individual technical responsibilities, thereby leaving practitioners inadequately prepared to enter complex team-based settings.[4,5] Because health care providers from different disciplines (such as nurses, surgeons, and anesthesiologists) are trained separately, it is often difficult for them to integrate their capabilities with other health care professionals. This inhibits the development of effective team formation, communication, and leadership sharing behaviors that are required to ensure effective patient safety. Lacking formal training in teamwork skills, health care professionals often function in proximate, parallel roles rather than in a true, integrated team fashion.[4,5] In effective multi-disciplinary teams, team members learn to understand and accommodate one another's judgments and attend to one another's safety concerns and limitations. These teams are anchored in the larger systems that surround the team and create an operational environment for successful team outcomes. Achieving safe patient care that results from the effective interaction of different disciplines is difficult to accomplish without an adequate understanding of the contributions of different care providers and the mechanisms that enhance interaction among them.

In-Situ Simulation® is an effective, team-based simulation strategy using AQP processes that occur on actual patient care units involving health care team members and actual organization processes. The *In-Situ Simulation®* and scenario design process creates a model that enables us to understand multidisciplinary teams and how they are anchored in the larger systems that encompass the team. The system uses reality-inspired or near miss data reporting scenarios of complex patient situations that require effective team coordination and technical skills in order to achieve safe patient care. With the aid of a fully articulated wireless mannequin, team members respond to the scenario as they would during a typical medical procedure. During the simulation, the team members' performance is recorded using sophisticated audio/visual recording equipment (including wireless microphones, cameras, and software tools) to capture and assess team dynamics for discussion during a post-simulation team debriefing. During the debriefing, examples of effective and ineffective team performance are identified and discussed. These behavioral examples are then used to identify effective teamwork behaviors that should be emulated going forward. System-level breakdowns are also identified and

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flagged for subsequent follow-up and resolution. Taken together, these actions help facilitate a culture of safety (COS) within the health care organization.

Although simulation-based team training is not new to the health care domain, most applications to date are conducted in an artificial laboratory environment.[6,7] In contrast, *In-Situ Simulation*® is conducted on actual patient care units involving actual health care team members and actual organization processes. Not only does this create a much more psychologically engaging learning experience,[8] it also allows for the identification, diagnosis, and remediation of system-level breakdowns. As a result, *In-Situ Simulation*® is much more than a training and performance assessment methodology – it is part of a larger organizational culture change initiative…one that is long overdue.

The most critical component of the *In-Situ Simulation*® is the facilitative debriefing. During the simulation, the team's performance is captured using sophisticated audio/visual recording systems to record examples of particularly effective and ineffective team performance. These recordings are then used to help diagnose breakdowns in team performance and system safety during a facilitative debriefing that occurs immediately following the simulation.

In health care, the discussion and critique of performance normally occurs in Morbidity and Mortality (M&M) conferences. The discussion is normally limited to technical rather than teamwork issues. Moreover, the tone of M&M conferences reinforces a "shame and blame" culture that is not conducive to the open discussion about human error (in order to learn from such errors). Finally, very little information about the health care organization's larger systems issues is discussed. In fact, it is often a one-way discussion of what went wrong given to the primary care provider. The very concept of a team is lost in the "Why did you?" mindset of the M&M conference. The reason for this is in part culture, and in most current systems in health care there is no meaningful way to capture the information concerning teams or the systems, which are involved in the case study. It is normally a very narrow focused discussion of the technical findings during the case.

In contrast, the debriefing of the *In-Situ Simulation*® is a facilitative discussion of the health care team about the team performance. The purpose of the debriefing is to help understand the complex team skills and knowledge required in today's world of patient care. In this perspective, the focus is on how behavior impacts patient care (both positively and negatively) rather than assessing individual performance. Emphasis is on "what is right" not "who is right." The process uses videotaped examples of the team's own performance to focus on teamwork and systems issues.

The debriefing videos are an extremely powerful learning tool, and seeing one's performance within the context of the group discussion is where the real learning occurs regarding the importance of teamwork in health care. This also leads to systematic self-reflection on the part of the team members and the identification of "lessons learned" going forward. This is significantly different than the current focus of simulation in

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health care, which focuses on the repetitive practice of technical skill. Although this technical simulation is critical, in the future it will be a combined curriculum which will allow health care professionals to practice their entire range of skills (both technical and teamwork) in a multi-disciplinary simulation environment which will create the learning for quality patient care.

We have been conducting *In-Situ Simulations*® in a wide variety of hospitals that range from 70 beds to 1,000 beds. We have visited several different units (OB, Emergency Department, OR, Cardiac Catheterization Unit, Medical, Surgical and Cardiovascular ICUs, etc.) and have run scenarios that have crossed disciplines at various hours of the day and night. For all *In-Situ Simulation*® scenarios crossing various patient care units, disciplines, and clinical settings the following have been identified as impacting teams and their performance:

- Even teams who have worked together for years still may not understand the roles and responsibilities of the other team members. This is most significant across disciplines.

- Health care professionals may not understand the need for standardized role definitions when working on the floor. A common mental model is that chaos is normal business, and the individual needs to perform what he/she thinks is necessary rather than be constrained by a predefined role.
- When observing scenarios where teams perform the same function together over and over (cardiac surgery team) each health care profession knows their role and performs in a standardized manner within that role. These teams perform significantly better when challenges are introduced or there is a need to switch roles when the team members change.
- If having well-defined roles improves performance, should all health care professionals learn roles and how the roles are assigned in a given situation? In any given situation basic roles would be understood; they would be a part of health care education. Within health care education there would be the ability to practice these roles with multidiscipline teams in simulation. In the future, teams would have predefined roles as they enter an OR for a Caesarian section, the SICU when receiving a new patient, or when working a difficult issue with a lymphoma patient. Without these role definitions the impact of any team-training program is severely limited. With no targets and anchors for team skills, it is just adding words to a sea of chaos.

"…tonight in this scenario I had ideas for the care of the patient that the physician was not thinking of, but could not say anything because I am just an X-Ray technician. I did not feel comfortable."

- There are few processes or backup plans if errors occur.
- Errors cannot be anticipated and corrected when the industry does not discuss their occurrence and causes.
- There is an unwarranted assumption by team members that everyone will perform at 100% with no methods to assure this is occurring.
- In health care, there has been a traditional assumption that all professionals always are on top of their game and not affected by fatigue or life events.
- Other relevant concepts include Task Saturation, Communication and Interpersonal Skills, Policy Compliance, Authoritarian Gradient, Situational Awareness, Appropriate Assertiveness, and Leadership Transfer.

"Although there is evidence that change is needed in how health care professionals learn, practice, and maintain their skills there has been little effort to change. The cost is thought to be too high for supporting these changes. What is missed is balancing these costs with the cost of error."

This quote from a debriefing said it all about the Authoritarian gradient and appropriate assertion issue-plaguing health care: "I am a President of a company outside of health care and have no problem speaking up. However, tonight in this scenario I had ideas for the care of the patient that the physician was not thinking of, but could not say anything because I am just an X-Ray technician. I did not feel comfortable."

Health care professionals work day after day in their organizations with varying degrees of support by their own systems. When the systems do not work properly, the team members often develop "work arounds" to achieve quality care for their patients. Some examples are:

- Surgery preparatory teams who gain information by eavesdropping outside doorways.
- Obtaining necessary resources by working outside of formal policies and procedures.
- Inappropriately using technology (or not using it at all) because it is too complex, cumbersome, or was provided without sufficient training.

The list goes on and on. Examples during a handoff from the emergency department to the cardiac catheterization lab of typical system issues are:

- No standardized process for which the patient is brought to the cardiac catheterization lab.
- No consistent information content or manner of sharing information between the two units.
- No specifically assigned roles concerning critical patient care needs.

In general we are seeing a loss of about 20 to 30 percent of the accuracy of information as a patient is transferred across disciplines within a health care institution. Critical information is omitted or altered in ways that can have a profound effect on patient care.

We will be analyzing the data from the *In-Situ* Simulations® and the assessment by the health care professionals on what are the critical issues for teams within health care and will be reporting periodically. Overall what we have seen are dedicated health care professionals, working extremely hard in systems poorly designed to account for the complexity of health care teams in an extremely complex

environment. Although there is evidence that change is needed in how health care professionals learn, practice, and maintain their skills there has been little effort to change. The cost is thought to be too high for supporting these changes. What is missed is balancing these costs with the cost of error. Medical mistakes that occur in hospitals account for a minimum of 120 deaths per day. In 2006, the Institute of Medicine estimated that medication mistakes alone added an extra 3.5 billion to the US health care tab each year. In our

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world this would be a crash of a Boeing 747 every week, killing everyone on board. It would seem the cost impact would be small if health care could just save one 747 from crashing by changing processes, training, and learning for health care professionals. ■

Dr. Hamman directs the Center of Excellence for Human Performance and Simulation Research at Western Michigan University, and Dr. Rutherford recently retired from the Center.

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The Academic Chronic Care Collaborative Experience and Resident Education in Ambulatory Medicine at Duke University

Jane V. Trinh, MD, Diana McNeill, MD, Mitch Heflin, MD, Lynn Bowlby, MD and John Weinerth, MD

It is widely recognized that management of chronic disease poses a major challenge for our society. An increasing number of Americans are living with chronic medical conditions, resulting in cost equivalent to over three-quarter of the total national health care expenditures. Deficiencies in chronic care management demand the redesign of primary care to close the quality chasm between current practices and optimal standards.

Edward Wagner, MD, MPH, at MacColl Institute of Healthcare Innovation designed the chronic care model in an effort to improve chronic illness management.[1] The chronic care model provides a framework for re-organizing primary care and identifies six essential elements: community resources and policies, health care organization, self-management support, delivery system, decision support, and clinical information systems.

Although his model has been incorporated into some health systems, few academic medical centers have adopted the complete chronic care model. Post-graduate trainees are at the center of a changing medical system. The Academic Chronic Care Collaborative (ACCC) evolved from a partnership with the AAMC and Improving Chronic Illness Care Program, a national program of the Robert Wood Johnson Foundation.[2] The major goal of this collaborative initiative was to improve the care of patients with chronic illness and the education of the health care teams providing the care in academic settings by implementing the chronic care model.[3]

The ACCC involved twenty-two academic institutions and took place over an 18-month period. Multidisciplinary teams from each institution implemented rapid change cycles and met to exchange ideas and to devise new strategies for continual change. Each team was charged with the challenge

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of implementing change in the care of one or more chronic conditions. Detailed change packages outlining specific interventions of the chronic care model were distributed at the start of the ACCC. An evidence-based change package was also developed to guide the process of resident education. Teams from each institution reported progress in population outcomes for their chosen chronic condition and educational outcomes to the ACCC at pre-specified time intervals.[4]

In July 2005, the mission, goals, and expectations of ACCC were introduced at several sites at Duke University Medical Center, including the Duke Outpatient Clinic (DOC). The DOC, serves as one of the ambulatory training sites for the Duke University Hospital Internal Medicine Residency Program. Approximately 60 of over 120 internal medicine residents at Duke have their primary care clinic at the DOC which provides medical care to a large uninsured and under-insured population of Durham, North Carolina. Fifteen attending physicians supervise residents in the residents' primary care clinics. The majority of these attending physicians do not have their clinics at the DOC but work at other sites at Duke.

"The integration of the chronic care model in the ambulatory setting as part of the ACCC had been initiated, and the EIP at Duke encouraged continued participation in the Collaborative through the creation of "practice partnerships.""

The involvement of residents in the ACCC has been facilitated by important changes in the structure of the internal medicine residency training program.[5] The Education Innovations Project (EIP), sponsored by the ACGME, aims to improve patient-centric care and individualized learning in resident education. The integration of the chronic care model in the ambulatory setting as part of the ACCC had been initiated, and the EIP at Duke encouraged continued participation in the Collaborative through the creation of "practice partnerships."[6] Practice partnerships are groups of three to four internal medicine residents who share the care of an outpatient panel. This system was implemented to allow residents to focus more exclusively on one setting during a given training experience. In the traditional model of training at Duke, internal medicine residents maintained outpatient continuity clinic while working on inpatient rotations. In the EIP model, residents on their ambulatory block have continuity clinics four times a week and residents on consult blocks have clinic two times a week. Residents on inpatient blocks are rarely in clinic. Consequently, residents on their ambulatory block can focus on chronic disease management and incorporate the chronic care model through the clinic's involvement in the ACCC.

The DOC chose diabetes as the chronic condition to implement changes to improve care. Diabetes affects over 40% of the patients at our clinic. Initially, we selected a pilot group of diabetic patients to apply parts of the ACCC diabetes change package. We later expanded involvement to our entire population of diabetic patients and explored ways to put into practice the elements of the chronic care model in the daily routine of our residents. In the following sections, we discuss changes implemented for diabetes care for each essential element of the chronic care model. Changes in resident education are most evident in self-management support, decision support, and delivery systems. Lastly, we will discuss outcomes of the ACCC, barriers to overcome, and our future directions.

Community resources and policies

Under community resources and policies, the chronic care model emphasizes that the health care organization has links with community organizations. The DOC has had a long-standing alliance with the Durham Community Health Network (DCHN), which assists Medicaid patients in identifying and accessing health care resources. Targeting diabetic patients through the ACCC helped residents identify which patients may most benefit from DCHN services. A nurse case manager was available weekly at the DOC and assisted residents with follow-up plans. A dietician and nurse from DCHN also participated in the Diabetic Group Visits model of care, which was instituted as part of the Delivery Systems element of the chronic care model.

Health care organization

The chronic care model emphasizes the importance of the organization and its leaders in supporting better care using ongoing quality measurement, improvement, and incentives. The administration at Duke supported the efforts of the ACCC and chose three teams as model programs for the institution. A site coordinator was hired to initiate the patient registry and to analyze the outcomes for the three Duke teams. Furthermore, the Patient Revenue Management Organization at Duke compiled an updated list of diabetic patients followed. The database, which is updated quarterly, allows us to track the progress of our diabetic patients in a more accurate manner. Because of the support from the Medical Director, we were also able to incorporate clinic staff members to aid us in the ACCC efforts. Lastly, the organization recognized our efforts by spotlighting the ACCC and novel diabetes care programs in an article in *Inside Duke Medicine*.

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Self-management support

Self-management is defined as the individual's ability to manage the symptoms, treatment, physical and social consequences and lifestyle changes inherent in living with a chronic condition. The "ABC's of Diabetes" form, created by other ACCC participants, was modified for the needs of our patients. The "ABC" form was implemented during the Diabetic Planned Visits and Group Visits. A self-management goal was set at each visit; residents were provided with handouts on ideas for realistic self-management goals to guide their patients. The fourth group visit series, entitled "How to Manage Your Diabetes," focused on self-management skills. Residents actively helped with goal-setting. After each visit, a nurse from the team made a follow-up phone call to see if their goal was achieved. A learning session was also organized to educate physicians, pharmacists, and nurses on skills to teach self-management and to lead groups in goal-setting.

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Delivery system

Delivery system design in the chronic care model encourages the practice team to have defined roles, to use planned visits to support evidenced-based care, to provide care management for high risk patients, and to assure regular follow-up and care coordination. As part of the ACCC, we implemented two different approaches for the residents to provide diabetes care to our patients. The first was the Diabetic Planned Visit, which was a one-on-one visit with a member of the practice partnership. Here, the "ABC" form was utilized. Diabetes standards of care measures were updated and diabetes specific education was provided. At the end of the visit, a self-management goal was identified and documented. The Diabetic Group Visit model entailed a series of four monthly sessions, with approximately 12 patients per group. Topics included nutrition, medications, community resources and patient self-management. Select residents on their ambulatory block participated in the facilitation of the visits, and they identified challenging patients and coordinated follow-up and referrals.

"The Diabetic Group Visits model entailed a series of four monthly sessions, with approximately 12 patients per group. Topics included nutrition, medications, community resources and "How to Manage Your Diabetes.""

Decision support

Decision support in the chronic care model requires that evidence-based guidelines are integrated into care, and supported by provider education, links with specialty expertise, and reminder and fail-safe systems. Residents are provided reminders for measures considered standards of care in the management of diabetes. These standards of care are also incorporated into their clinic notes. Endocrinology consultation is available weekly, and pre-clinic conferences for residents provide information on updates in diabetic therapy. Pharmacy consultation for complicated diabetic patients offers another system to improve the care. Finally, with the assistance of the endocrinologists, an algorithm for outpatient management of hyperglycemia in type 2 diabetes was created and is being tested in three practice partnerships to assess if more structured guidance in titration of diabetic medications will improve outcomes.

Clinical information systems: Registry

For data management, the chronic care model uses a database of clinically useful and timely information on all patients provides reminders and feedback and facilitates care planning for individuals or populations. The Chronic Disease Electronic Management Systems registry for diabetes is maintained by the ACCC site coordinator. Periodic updating of the registry allows analysis of the process and outcome measures for diabetes management. Process measures and outcome measures are produced for the clinic, individual partnerships, and individual patients. The data analyses, organized by practice partnership, offer feedback to each partnership and identify areas of improvement.

"Periodic updating of the registry allows analysis of the process and outcome measures for diabetes management. Process measures and outcome measures are produced for the clinic, individual partnerships, and individual patients".

As part of the ACCC, we set goals in improvement in diabetes care for population and educational outcomes. After the interventions were implemented, we tracked our progress during the 18 months of the ACCC period. For process measures, we showed improvement in the percentages of patients with dilated eye exams, flu and pneumococcal vaccinations, the measurement of more then two hemoglobin A1C's in the last year, documented comprehensive foot exam in the last year, and documented self-management goal in the last year, as compared to baseline. The percentage of patients with goal LDL of less than 100 in the last year also improved. Unfortunately, the percentage of patients with hemoglobin A1C's of less than 7% and blood pressure of less than 130/80 did not improve over this time period.

"…patients often have many logistical challenges to overcome before they can take care of their chronic conditions, including communication and transportation. Lastly, of course, change is not easy and not easily sustained."

Through our experience with the ACCC, we learned to incorporate elements of the chronic care model into the curriculum of our residency education. We implemented evidence-based changes into our practice for caring for patients with chronic illness and exposed residents to novel approaches of providing chronic care. However, we encountered several barriers at both the physician and institutional levels. First, our physicians only work part time at the DOC and buy-in for projects and changes met resistance. Because of the rotating schedules of the ambulatory blocks and practice partnerships, familiarity with the proposed changes was lacking. Furthermore, limited staff availability and lack of reimbursements (time and financial) for services posed significant challenges to disseminating our interventions. Communication about quality improvement concepts with administrative leadership and attending physicians was often incomplete. At the DOC, the patients often have many logistical challenges to overcome before they can take care of their chronic conditions, including communication and transportation. Lastly, of course, change is not easy and not easily sustained.

"Our experience with the ACCC has enhanced our awareness of changes necessary to improve chronic illness management in primary care and to enhance resident education in the chronic care model."

Our experience with the ACCC has enhanced our awareness of changes necessary to improve chronic illness management in primary care and to enhance resident education in the chronic care model. The emphasis on a multidisciplinary approach and system changes are crucial components to the acceptance and the success of the chronic care model in day-to-day practice. Only through changes in all elements of the chronic care model and the early introduction of this model in resident training will we begin to close the quality chasm between current practices and optimal standards. ■

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The Academic Chronic Care Collaborative and the Educational Innovations Project (EIP): The University of Cincinnati (UC) Academic Health Center Experience

Eric J. Warm, MD, FACP, James Boex, PhD, Gregory Rouan, MD, FACP

The majority of health care in the United States occurs in the ambulatory setting, yet the focus of most Internal Medicine graduate medical education (GME) has been inpatient-based.[1] As a result, ambulatory GME experiences are usually perceived by residents to be less rigorous and of lower quality than inpatient experiences.[2] Residents generally leave residency without the requisite knowledge, attitudes, and skills needed to function in the ambulatory setting, and this may ultimately contribute to the unmet needs of patients.[3] Over the past three years the University of Cincinnati Department of Internal Medicine has sought to address these problems through our involvement with the Academic Chronic Care Collaborative (ACCC)[4] and more recently the ACGME's Educational Innovations Project (EIP).[5]

The Academic Chronic Care Collaborative

The ACCC represents a network of twenty-two academic medical centers committed to implementation of the Chronic Care Model (CCM), a primary care framework that identifies four essential interdependent components (self-management support, delivery system design, decision support, and information technology) within the broader context of the community and health care system.[6,7,8] Under the aegis of the collaborative, teams of physicians, nurses, administrators, residents, and office personnel met regularly for intensive learning sessions using the Breakthrough Series Collaborative format developed by the Institute of Health care Improvement.[9]

At Cincinnati, our pilot began in July 2005 and consisted of 200 diabetic patients from 1 faculty member, 7 residents, and a nurse practitioner. We created and employed a chronic disease registry, instituted weekly inter-professional practice team meetings (including residents when available), developed expertise in small tests of change – Plan-Do-Study-Act cycles.[10] Importantly, we learned how to assess and improve the quality of care we deliver, and we adopted a more patient-centered approach to care.

While our experience with the Collaborative was transformative, it did not fully address the educational needs of the residents, or the needs of the patients. Inpatient service demands still overshadowed ambulatory time. Residents in the pilot project often missed team meetings, and patient scheduling was resident-centered, not patient centered. However, our involvement in the ACCC was critical in providing insights that led to our successful application for participation in the EIP.

"While our experience with the Collaborative was transformative, it did not fully address the educational needs of the residents, or the needs of the patients. Inpatient service demands still overshadowed ambulatory time. Residents in the pilot project often missed team meetings,and patient scheduling was resident-centered, not patient centered."

Next Step: The EIP Block Intervention

The EIP is a national pilot effort designed to enhance the flexibility of successful Internal Medicine residency programs that have been successful in meeting ACGME guidelines. To date, standardization of accreditation requirements by the Residency Review Committee for Internal Medicine (RRC-IM) has resulted in significant improvements in programs with structural or resource deficiencies. However, the RRC-IM realized that the success gained by prescriptive program requirements might have come at the cost of less creativity and innovation. In the EIP, selected programs with track records of success in accreditation and ABIM outcomes were given the chance of entering a new, alternative pathway to accreditation.[5]

At Cincinnati, the proposal was broad, and included such diverse elements as removing overnight call from the inpatient ward teams, and creation of a robust interactive resident portfolio. The centerpiece of our proposal was the implementation of a year-long ambulatory group practice experience combined with elective and clinical research time called the EIP Long Block.

"Our ambulatory patients are generally of lower socioeconomic background, and have multiple chronic problems punctuated with frequent exacerbations."

We created our model by studying our patients and the outcomes of their care. Our ambulatory patients are generally of lower socioeconomic background. They have multiple chronic problems punctuated with frequent exacerbations. They are usually referred to us from the emergency department (ED) or hospital after (or during) an acute exacerbation of illness. We compared patient care outcomes

of our resident practice and the adjacent faculty practice, and found some striking differences. For example, despite a similar case mix, resident patients were twice as likely to visit the ED as the faculty patients. In addition, most resident clinical process and outcome measures were less favorable than those of the faculty.

In addition to experience, one advantage the faculty had over the residents was continuity. Over any given three-year period resident patients averaged 7 treating physicians. This problem intensified after work-hours restrictions were instituted when inpatient service demands required us to float clinic sessions across multiple days of the week. Correspondingly, we believed that major reasons for high ED visit rates and poor clinic measures in the resident practice included a lack of continuity and the resultant inability to form meaningful therapeutic relationships.

"One of the tenets of the CCM is that during the stable phase of a chronic illness the system of care, irrespective of the individuals in it, is the most important entity in delivering good care. However, during an exacerbation of chronic illness, the presence of the specific practitioner assumes increased importance."

One of the tenets of the CCM is that during the stable phase of a chronic illness the system of care, irrespective of the individuals in it, is the most important entity in delivering good care. However, during an exacerbation of chronic illness, the presence of the specific practitioner assumes increased importance. One physician seeing and managing an acute exacerbation of illness, setting a plan in motion, and arranging follow-up based on patient need (not physician availability) is more effective than multiple physicians attempting to do the same. Being able to deliver this "burst continuity" and bridge a patient over an acute illness until the patient's regular system of care is able to take over once more. The chronic stable periods are what our previous resident system lacked. We developed the hypothesis that one year of true continuity would be better for patient care and therapeutic relationship-building than three years of discontinuity. Hence, the EIP Long Block was conceived and then implemented for the first time in November, 2006.

We considered other shorter block models (e.g., two months of inpatient medicine, followed by one ambulatory month), but felt this would not match the needs of the patients. Patients do not get sick 'every three months' and therefore in a shorter block model patients would have to be shared among teams of residents. Experience with panel-sharing showed us that patients do not identify who their primary physician is, and residents do not always take ownership of a given patient's care for the same reason.

"Scheduling systems are designed to foster patient-centered continuity of care and improve access to care."

The EIP Long Block runs from the 17th to 28th month of residency. Residents transition from primarily inpatient-based rotations (e.g., unit and ward experiences) to an expanded outpatient experience. They see patients in the ambulatory practice three half-days per week, but are required to be present in the practice (to answer messages, etc.) for at least some time every day. Scheduling systems are designed to foster patient-centered continuity of care and improve access to care. The remainder of the residents' time is spent on elective and clinical research experiences with minimal overnight call.

Tuesday afternoons during the EIP Long Block are reserved for team meetings, a quality improvement curriculum, and ambulatory education topics. The team meetings are inter-professional. Residents, faculty, nurses, social workers, pharmacists, administrators, office staff (and occasionally patients) meet weekly and utilize the Chronic Care Model and the Model for Improvement to improve care.

We expanded the disease registry from the initial ACCC diabetes patients to all patients in the practice, and we are currently tracking twenty-three core processes and outcome measures (**Exhibit 1**, next page). These clinical outcomes are reported semiweekly during the team meetings. Each resident receives a score and rank on each measure compared to his/her peers and the group as a whole. These data are then used to decide which system-based practice projects to focus on. The EIP Long Block format allows us to assign responsibility and accountability for a given population of patients to each resident. Doing so has made the impact of the data personal, and motivated the residents to improve more than any other intervention. This is consistent with the literature on the effect of feedback to physicians.[11] Instead of being an add-on to an already busy schedule; we put the improvement curriculum 'in the water'. Assessing and improving the quality of care for a defined population is what the residents do every day while they are on the EIP Long Block.

Results

To date the results have been extremely encouraging. Virtually all core process and outcome measures have improved **(Exhibit 1**, next page**)**. For example, the number of patients with hypertension at goal blood pressure has improved by 26%, and number of tetanus vaccinations are up 260% since the start of the EIP Long Block. In addition, residents reported in a survey that the EIP Long Block promotes formation of continuous, healing relationships with their patients. At the start of the EIP Long Block residents felt on average that they had a healing relationship with only 15% of their patients, but midway though this number now approaches 50%.

Exhibit 1

University of Cincinnati Practice Report (June 1, 2007)

	Practice Goal %	Practice Data December	Practice Data 6.1.07	% Change Since December
Total Number of Patients		1516	2768	83%
Men/Women		617/899	1102/1664	
Absolute Number with DM		402	803	
Absolute Number with HTN		641	1519	
% Number with DM		26.5%	29.0%	
% Number with HTN		42.2%	54.9	
Measures Diabetes				
***Patients with A1C < 7	60	42.2	42.5	1%
***Patients with BP < 130/80	40	39.7	45.6	15%
Patients with comp. foot exam in 1 year	90	32.8	45	37%
Patients with 2 A1C's in 1year	90	45.8	39	-15%
Patients on ACEi or ARB	75	68.1	78.1	15%
Patients taking statins	60	52.1	70.4	35%
***Patients with LDL < 100	70	63.6	65.2	3%
Patients taking aspirin	80	61.5	78.9	28%
Patients with an eye exam in 1 year	70	27.9	34.5	24%
Patients with pneumovax	90	69.7	72	3%
Patients with flu shot	90	43.5	69.1	59%
Measures HTN				
***Patients with BP < 140/90	60	45.7	57.4	26%
***Patients with LDL < 100	80	62	60.6	-2%
Measures Prevention				
Women ages > 42 with mammogram < 2 yr	50	32.5	48.7	50%
Patients > 51 with colonoscopy	30	26	38.7	49%
Women ages > 21 pap < 3 yr	30	19.8	47.4	139%
Men with PSA age 50-70	60	24.7	44.9	82%
Patients with dT or tDap in past 10 yr	60	12.1	43.6	260%
Patients age 65 with pneumovax	90	45.9	71.9	57%
Patients age 50 flu shot	90	40.8	62.4	53%
Women age > 65 with DEXA in 5 yrs	60	20.9	45.1	116%
***Percentage of Smokers	20	38.3	40.3	5%

"We also found that the EIP Long Block has significantly increased the contact time that a patient spends with a specific primary provider. The chances that a patient speaks to or sees his/her own primary care physician when he/she calls or visits the practice now exceeds 80%, a 30% improvement."

We also found that the EIP Long Block has significantly increased the contact time that a patient spends with a specific primary provider. The chances that a patient speaks to or sees his/her own primary care physician when he/she calls or visits the practice now exceeds 80%, a 30% improvement. In addition there has been a trend toward decreased ED utilization and increased clinic utilization. As a result, patient satisfaction, particularly regarding physician care has increased.

Our practice has become a model for other practices throughout the academic health center, and we often have visitors at our team meetings. We also used the project to develop a successful AAMC project involving medical students and chronic care. Much of the data was generated by the residents, and now is being submitted for publication and presentation at regional and national meetings.

The EIP Long Block has also allowed us to create a robust evaluation of resident performance. Residents are evaluated by the clinical quality indicators, a chart review, 360 degree evaluations (including patient reports), team participation, a multiple choice exam, objective structured clinical examinations and a self evaluation. The data is synthesized using our evolving digital portfolio (another component of UC's EIP) into a personal learning plan for each resident.

"Considerable return-on-investment has occurred that includes decreasing ED visits for a capitated patient population and hospitalist care resulting in other efficiencies."

Discussion

Overall the cost of implementing the ACCC and the EIP has been considerable. This is in large part due to "replacement cost" of residents who previously provided care for inpatients and is estimated to be approximately $16,000 per resident. The majority of these costs resulted from hiring additional hospitalists to cover the inpatient ward work that residents assigned to the EIP Long Block were no longer able to undertake. Considerable return-on-investment has occurred that includes decreasing ED visits for a capitated patient population and hospitalist care resulting in other efficiencies.

To date, the value of the success of the ACCC and the EIP has been worth these costs to our hospital, and their continuing support represents a critical endorsement of not only our efforts at Cincinnati, but potentially to the openness to innovation which the entire EIP effort represents. We are pleased with the improvements to patient care and GME which we have seen to date, and are encouraged that they will continue to improve as our efforts mature in the years to come. ■

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Changing Clinical Practice in the Southern Illinois University Ambulatory General Medicine Clinic to Improve Chronic Illness Care and Education

Maureen D. Francis, MD, Susan T. Hingle, MD, and Andrew Varney, MD

Background

Chronic diseases are the leading cause of death in the United States, and chronic illness care accounts for 75% of our total national health care expenditure. Yet studies show that fewer than 50% of patients with chronic illnesses receive accepted treatments, and fewer than 50% have satisfactory levels of disease control.[2] In the face of this dilemma, our current health care delivery system falls short.[5,6,9]

The chronic care model proposed by Ed Wagner and colleagues offers a new paradigm for chronic illness care. There are six main components of the model: community involvement, self-management support, health care system changes, delivery system design, decision support, and clinical information systems.[3,9,11] The goal is a productive interaction between a prepared practice team and a motivated patient. Since June 2005, the General Internal Medicine (GIM) Division at Southern Illinois University has been working, through the Academic Chronic Care Collaborative, to implement the chronic care model. The purpose of the collaborative is to improve care for our patients and to ensure high quality education in chronic care for our trainees. Our participation in the Educational Innovations Project (EIP) has strengthened our efforts.

"Diabetes mellitus type 2 is the third most common diagnosis in our clinic."

Setting

The GIM ambulatory service is organized into three teams: Green, Blue and Red. Each team currently consists of 3 attending physicians and the residents who work with them in their continuity clinics. Residents have one to two clinic sessions per week, depending on their level of training. Diabetes mellitus type 2 is the third most common diagnosis in our clinic. At the start of the collaborative, we used billing data to identify patients with a diagnosis of type 2 diabetes followed by our faculty and residents.

In general, system changes were tested and refined on the Green team, and then spread to the other teams. Key leaders were involved from the outset of the project. The change team included the Chairman of the Department of Medicine, the Division Chief for General Internal Medicine, one additional faculty physician, three residents, our nursing administrator, four clinic nurses, reception staff, a computer and programming expert, and a representative from the central administration of the practice plan. Our team met weekly for the first 18 months of the project, and now meets twice per month.

Interventions

Over the course of the collaborative, we began work in all six domains of the chronic care model. We would like to highlight our progress in three areas: clinical information systems, self-management support, and delivery system design.

"…information is available at each patient visit and is updated after each encounter, and when new lab data is available. This allows us to follow 14 quality metrics for 870 patients with type 2 diabetes."

Clinical Information Systems

At the start of the collaborative, we developed a diabetes registry using public domain software: the Chronic Disease Electronic Management System (CDEMS®). Medical students were hired to extract baseline data from our medical records, and support staff entered the patient information into the registry. CDEMS® information is available at each patient visit and is updated after each encounter, and when new lab data is available. This allows us to follow 14 quality metrics for 870 patients with type 2 diabetes.

Development of this registry was fundamental to our work. Registry data is used to improve care for an individual patient at the point of care by organizing data on key quality indicators and making their data easily available at the time of the patient's visit when decisions are made. It also allows us to track progress over time at a population level. Exception reports can be generated to identify patients who need a particular service and for targeted interventions, including patients in need of better control of their disease, like those with HgbA1C over 7%, or those due for a particular service such as administration of pneumococcal vaccine.

Providers, including residents, receive feedback on their performance monthly. Each receives a summary sheet and run charts graphing the 14 indicators for their individual panel of patients and a set showing team performance. Nursing and support staff receive a team report. Since September 2006, each team holds a monthly multidisciplinary meeting to discuss registry reports and ideas for improving care. One outcome measure and three to four process measures are highlighted each month in the discussion. Decision support

tools, such as guidelines for control of hyperlipidemia, are reviewed. Barriers to improvement are discussed, and potential solutions and Plan-Do-Study-Act cycles are initiated[7].

Self Management Support

The focus of self management support is to empower patients with the skills necessary to become partners in their own care. Patients set goals for improvement and take responsibility for their own health. For example, goals may be in the area of diet, exercise, self-measurement, or medication use. Goals set are concrete and achievable within one to two weeks.

This differs from traditional patient education in which patients are passive recipients of information that we, as providers, feel they need. Partnering with patients in their care is new to many physicians who are accustomed to taking charge and giving orders. Therefore, when we started the collaborative, everyone learned how to provide self management support. Faculty, residents, and nursing staff on the change team attended a session on motivational interviewing. Change team members became familiar with the process and then spread the techniques to others. Our three resident leaders were critical in teaching other residents the fundamentals. Self management support with goal setting and action planning can restore hope for both chronically ill patients and their providers.

"….we have developed a Communications Curriculum for our residents. Residents meet for 3 and 1/2 hours once a month during the PGY-2 year. The sessions include both didactic material and experiential pieces, such as standardized patients and role playing."

Additionally, we have developed a Communications Curriculum for our residents. Residents meet for 3 and 1/2 hours once a month during the PGY-2 year. The sessions include both didactic material and experiential pieces, such as standardized patients and role playing. They cover topics related to improving self management of our chronically ill patients, such as health literacy, counseling techniques, and interacting with geriatric and adolescent patients.

Exhibit 1
Measuring Progress

Outcome measures

	Green Oct 2005	Green June 2007	Blue June 2007	Red June 2007	Goal
HgbA1C <7%	60.5%	45.3%	48.8%	43.5%	60%
BP <130/80	41.0%	39.0%	32.4%	40.5%	40%
LDL <100	45.9%	52.0%	39.6%	56.8%	70%

Process measures

	Green Oct 2005	Green June 2007	Blue June 2007	Red June 2007	Goal
Foot Exam	55.6%	89.7%	78.9%	60.5%	90%
Self management	2.4%	59.6%	26.3%	14.3%	60%
Current smokers	10.9%	16.1%	17.3%	20.9%	11%
2 HgbA1C in last year	36.5%	40.4%	12.1%	11.3%	90%
Influenza vaccine	30.7%	36.3%	30.6%	23.3%	90%
Pneumococcal vaccine	17.6%	66.4%	54.3%	47.2%	90%
Microalbumin screen	41.4%	47.3%	10.6%	14.2%	50%
Patients ≥55 on ACE/ARB	81.0%	70.1%	65.5%	68.6%	80%
Patients ≥ 40 on statin	61.0%	59.3%	56.2%	61.0%	60%
Patients ≥ 30 on Aspirin	46.5%	73.5%	65.7%	49.2%	80%
Retinal exam documented	25.8%	62.8%	59.5%	41.9%	70%

Delivery System Design

The health care system in the United States is generally geared toward acute illnesses and exacerbations of chronic illness, with little infrastructure in place to adequately deal with chronic conditions.[12] Prior to the start of the collaborative, our local system was not designed to proactively monitor patients with chronic illnesses. The diabetes registry now allows us to easily identify patients who are due for appointments, lab testing, and other ancillary services. Each month our receptionists generate lists of patients who are due for a planned diabetic visit. This is an office visit focused on all aspects of quality diabetes care. Standing orders for labs are in place, and patients are encouraged to have testing done prior to the visit so results will be available during their clinic visit. This allows the provider and patient to discuss the results and reach decisions at the time of the office visit. Thus, we are shifting the focus from episodic acute care to planned chronic care.

"The diabetes registry now allows us to easily identify patients who are due for appointments, lab testing, and other ancillary services."

Results

By October 2005, baseline data was available for the patients followed by the pilot Green team. This baseline data is shown in **Exhibit 1**, along with the most recent data from the Green, Blue, and Red teams. This shows change spread from the Green team to the Blue team to, most recently, the Red team.

Our greatest initial successes are in five process measures: documentation of a comprehensive foot exam, self management support, pneumococcal vaccine administration, aspirin use, and documentation of a retinal exam. Improvement in each area is the culmination of many interventions by the entire team. For a comprehensive foot exam, disposable monofilaments are stocked in each exam room to make them readily available, and the medical assistants ask patients with a history of diabetes to remove their shoes and socks. Pamphlets on proper foot care are available in exam rooms, and providers receive reminders about the comprehensive exam. Self management support techniques are discussed at team meetings, and a self management support form with ideas for achievable goals is available in the clinic.

"Patients are scheduled for two week follow-up calls with their residents to discuss progress on their self management goals using a system developed by our reception staff."

Patients are scheduled for two week follow-up calls with their residents to discuss progress on their self management goals using a system developed by our reception staff. Letters describing the benefit of a pneumococcal vaccine were sent to all patients identified by the registry as needing the vaccine. Then, the nurses set up vaccine clinics to make it easy for patients to walk in and receive their immunization. Residents on several teams asked for lists of patients eligible for aspirin therapy and called each patient to discuss starting aspirin therapy. We repeatedly discovered that there is no one answer to a problem, that a series of interventions is usually necessary, and that input from all members of the team is valuable.

A major barrier to improvement in outcome measures is clinical inertia. At the start of the collaborative, 61% of our patients were on a statin but only 45.9% were at goal for their LDL, indicating that many patients were not on optimal doses of their medication. In addition, 26% of patients have a HgBA1C between 7% and 8%, and 20% of patients have a BP between 130/80 and 140/90. Thus, it appears that many patients hover just above goal, so we, as providers, need to overcome our hesitation to intensify therapy for patients who fall just short of their goal.

Summary

We learned a number of valuable lessons in the collaborative. First, very little would have been accomplished without the registry. Second, residents on our pilot team were effective in teaching other residents about the chronic care model,[4] particularly in the use of the registry and in self management goal setting. Planned care is a shift for both patients and providers. It is more rewarding to work with patients who are engaged and motivated to take part in their care. Finally, teamwork is invaluable.

To sustain the gains and to work toward future improvement, the chronic care model is now embedded in our curriculum and in our clinical practice. Our monthly multidisciplinary meetings provide an opportunity for all members of our teams to interact, learn about registries, assess the care provided by the team, and look for opportunities for improvement. Feedback indicates that individuals find multidisciplinary team meetings to be a valuable learning experience.

Our clinic is in the process of implementing an electronic health record. In conjunction with this, we plan to expand decision support tools. Three of our nurses recently completed the Chronic Disease Self Management Program at Stanford, and they are currently offering their first six week course to our patients. We plan to expand training in self management support for new residents as they join our teams.

As we look to the future at SIU, we plan to develop reliable evaluation tools to track resident clinical performance by level of training and program type (categorical vs. medicine/psychiatry). The evaluation tools will reinforce the importance of the components of quality chronic care. We will extend the lessons learned in diabetes care from the Academic Chronic Care Collaborative to other chronic illnesses, such as hypertension and hyperlipidemia, and to other clinical settings, such as the subspecialty areas. This will foster collaboration. Development of chronic illness indicators in other divisions is already underway. As we partner with our affiliated hospitals, we will also develop inpatient quality and safety measures to compliment and reinforce the lessons learned from the Academic Chronic Care Collaborative and the Educational Innovations Project. ■

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Redesigning Care for Chronic Disease: Using Clinical Outcomes to Drive Curriculum and Patient Care in a Residency Based Clinic

Ron Jones, MD, David Sweet, MD, Steven Radwany, MD, Lynn Clough, MA, Joseph Zarconi, MD

The Problem: Delivery of Chronic Care in an Acute Care Model

Summa Health System's Internal Medicine residency has embarked upon a redesign to enhance the care of patients with chronic conditions and to improve the education of residents in this area. The initial impetus for this redesign came through participation with other Internal Medicine and Family Medicine teams in the Academic Chronic Care Collaborative (ACCC) sponsored by the Robert Wood Johnson Foundation and the Association of American Medical Colleges. Subsequently, redesign of clinic services and educational curricula became central features of Summa's successful application for participation in the Residency Review Committee for Internal Medicine's Educational Innovation Project (EIP).

Residents and faculty see 100 patients per day in the General Medicine Clinic located on the hospital's campus. The practice consists primarily of disadvantaged individuals many of whom have one or more chronic medical conditions. Entry into the ACCC exposed several deficiencies.

"ACCC participation required development of a chronic disease registry and measurement of baseline outcomes for 16 clinical and process metrics in a subset of diabetic patients. This baseline assessment revealed that only 23% of patients in the study sample had achieved an HbA1c <7; 56% had LDL levels under 100 and 22% had BP readings less than 130/80."

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CALL FOR ABSTRACTS

2008 ACGME ANNUAL EDUCATIONAL CONFERENCE

February 29 – March 2, 2008

The Marvin R. Dunn Poster Session

"Building Community, Improving Quality"

The Accreditation Council for Graduate Medical Education (ACGME) invites abstracts for poster presentations at its annual conference February 28 – March 2, 2008 at the Gaylord Texan Resort and Convention Center in Grapevine, Texas. The purpose of the poster session is to provide a forum for discussion of innovations in graduate medical education that impact the learning environment in ways that improve educational outcomes, including:

1. Teaching and assessing the general competencies (with a special interest in methods related to teamwork and collaboration and the use of portfolios);
2. Using assessment results to drive and guide program improvement;
3. Changing the learning environment or redesigning education and patient care (with a special interest in measurable improvements in patient safety, patient care outcomes, resident educational outcomes); and
4. Implementing strategies and methods, including faculty development, to facilitate educational improvement and quality at the institutional or program level.

Accepted abstracts will be presented on **Friday, February 29, 2008 from 5:30p.m. – 7:30p.m.** during a poster session/reception. All abstracts accepted for poster presentation will be considered for special recognition and featured as oral presentations, unless the author(s) indicate a wish not to be so considered. **Criteria for abstracts and oral presentations are the following:**

- **Background:** clearly articulated context for project or research study including relevant literature
- **Objective:** substantive; clearly stated purpose of the project or research study
- **Methods:** clear description of how the project was conducted and/or implemented; project design sound and appropriate
- **Results/Outcomes/Improvements:** clear and unambiguous statement documenting the changes and/or improvements
- **Significance:** implications of the project beyond the local setting

SUBMISSION REQUIREMENTS FOR ABSTRACTS

Description of Abstracts

Completed or in-progress investigations or projects related to one of the four areas of innovation listed above are invited.

Format Requirements for Abstracts

- Only abstracts typed on the Abstract Submission Form and submitted electronically will be considered.
- All text should be typed within the perimeters of the box shown on the submission form.
- Type the abstract title IN ALL CAPS. Make the title brief, but clearly indicate the nature of the study. DO NOT use abbreviations in the title.
- Type presenter(s) name(s) and institutional affiliation(s) in upper and lower case letters beneath the abstract title.
- List each presenter and their affiliation separately.
- Communication regarding the abstract will be made with the first author listed only.
- At least one author must be registered to attend the conference.

NOTE: Simple graphs or tables as well as up to 3 literature references may be included if they fit within the perimeters of the box shown on the Abstract Submission Form.

Organize the text of the abstract as follows:

- Background
- Objective of the project/study
- Methods, including design and analyses
- Results/Outcomes/Improvements
- Significance, implications/relevance beyond local setting

Abstract checklist

1. All abstract text must fit in the box
2. Capitalize the title of the abstract.
3. Single space the abstract body.
4. **Abstract must not exceed 500 words,** including simple tables/graphs but excluding title, authors, and references.
5. Indicate if you do/do not wish to be considered for an oral presentation **(Friday, February 29, 2008, 1:30 – 4:45p.m.).** Preference will not affect decision for acceptance as poster-only presentation.

SUBMISSION DEADLINE

All submissions must be received at the ACGME office on or before **November 16, 2007.** Send your submissions electronically using the form below to: abstracts@acgme.org. **FAX SUBMISSIONS ARE NOT ACCEPTABLE.** All communication regarding the abstract will be made with the **FIRST AUTHOR** only.

were the result of attempting to provide chronic care in the context of an acute care clinic. The availability of this information demonstrated the great potential for improvement.

Participation in the ACCC equipped the team to use the evidence-based Chronic Care Model developed by Ed Wagner, MD (www.improvingchroniccare.org) to redesign the clinic and to involve residents in the transformation. Quarterly national conferences led by experts in the Chronic Care Model and continuous quality improvement methods provided an ideal setting to collaborate with other academic centers redesigning their processes of resident education and care delivery. Outcomes were reviewed monthly to measure improvements in processes of care and continually improve patients' clinical outcomes.

Preparing For Redesign: Training Faculty and Staff to Use the Chronic Care Model

The Breakthrough Series learning model (from the Institute for Healthcare Improvement) was used in the redesign. Representatives from each patient care group – faculty, residents, nurse practitioners, supervisory RN's and secretarial staff as well as our clinical expert and chief resident attended the training. Key steps leading to effective care delivery redesign included:

- Formation of a clinic redesign team ("Change Team") comprised of representatives from all levels of daily clinic operation meeting twice monthly
- Inclusion of residents in planning small tests of change and reporting results
- Early involvement of a clinical expert (endocrinologist) in algorithm design and application of national guidelines for diabetic patients
- Identifying early design failures with small tests followed by successful revisions before attempting spread
- Monthly measurement and reporting of clinical and process outcomes
- Departmental and institutional commitment to educational and patient care redesign

The use of outcome-based measures in a continuous conversation with residents seeing patients in the continuity clinic is changing the culture of learning in the residency. This is evidenced in resident awareness of the impact of change on critical patient care metrics in the pilot group such as HgBA1C, LDL and BP. Enthusiasm for the process has resulted in residents from each training year serving in leadership roles in the Change Team.

Innovations Used for Outcome Improvement

The Summa Internal Medicine team chose diabetes for its first chronic disease aim. Specific outcomes were identified and a subpopulation was targeted for trials of the new model. Plans for implementation to the entire clinic were deferred until elements of the redesign model were tested and refined.

Use of the Chronic Care Model requires a *clinical information system.* The Chronic Disease Electronic Management System (CDEMS®) was utilized to establish a diabetes registry. The primary use of the registry has been to proactively manage care for patients and to measure improvements.

Another key element in the Chronic Care Model is *self management support* for patients. A Self Management Goal Sheet was developed to help residents collaborate with patients in choosing a measurable, achievable self care goal for their diabetes and to activate patients for effective self care. Residents designed tests to determine how the goal sheet was utilized with patients to further refine its content.

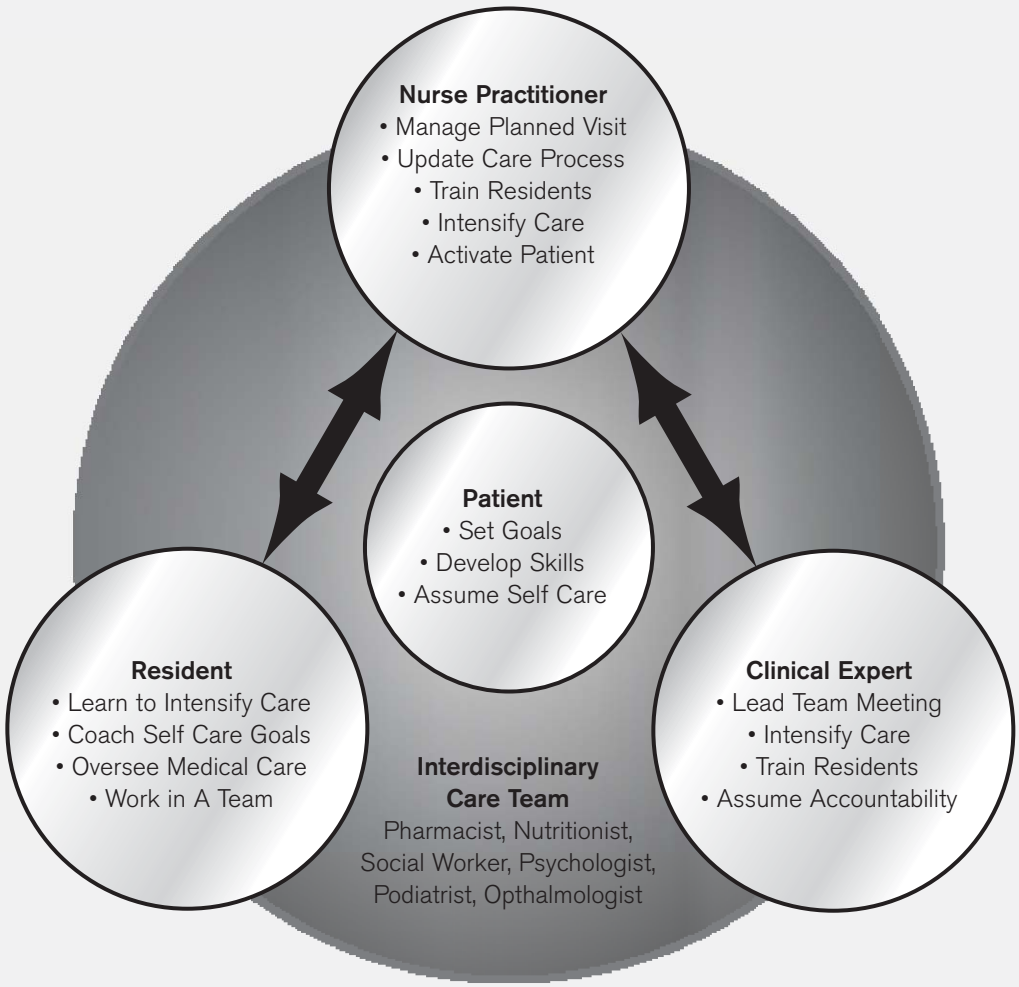
The Summa ACCC/EIP Change Team Aim: We will redesign our residency-based academic practice to fully integrate the chronic care model into the process of resident education and ensure that the population of clinic patients with diabetes have: HbA1c levels less than 7.0; documented self management goals; BP below 130/80; comprehensive foot exams every year.

Effective *delivery system design* requires giving team members clearly defined roles as they treat patients with chronic disease. Some system changes which had a significant impact on clinical outcomes include:

- Redefined roles for the resident provider, nurse practitioner and clinical expert as key agents to intensify care for chronic disease patients who have not reached clinical goals.
- A practical team model of care (Collaborative Management Model, shown in **Figure 1**, next page) to use for planned visits

Decision support is provided through an interdisciplinary team meeting directed by an endocrinologist and is supported by training podcasts focused on evidence-based standards of care and algorithms to drive medication intensification.

Figure 1
Summa Colaborative Intensification Model



Educational Innovations: Chronic Disease Curriculum

The Summa faculty has assembled the new tools and methods used in the care of patients with chronic disease into a skill and knowledge-based training cycle. The Chronic Care Curriculum module is now included in the ambulatory care rotation month. As an integrated curriculum, the module employs a variety of faculty members using direct observation and instruction to introduce residents to chronic care innovations being used in the clinic. Key educational innovations include:

"As an integrated curriculum, the module employs a variety of faculty members using direct observation and instruction to introduce residents to chronic care innovations being used in the clinic."

1. Collaborative Intensification Model for Planned Visits. Using an experiential approach, residents are introduced to the Chronic Care Model in which they work with a nurse practitioner and clinical expert to intensify needed care through the use of clinical algorithms for glucose, blood pressure and LDL control. The nurse practitioner coordinates planned visits and mobilizes a pharmacist, social worker and behavioral scientist for specific patient care needs. The CDEMS patient registry allows prospective identification of patients in need of tests or intensified care which permits visits to be scheduled with specific targets in mind. This has resulted in a significant improvement in the processes of care **(Figure 2,** page 23) and in clinical outcomes **(Figure 3,** page 24**).**

One second year resident expressed satisfaction with the new model stating: "I don't feel alone now when I'm trying to see these patients with long term illness. I don't dread their appointments because there is a team working with me."

2. Interdisciplinary Team Meeting Linking Specialists and Generalists. Case presentations made by residents to the interdisciplinary team focus on our most challenging patients who may have multiple reasons for not reaching clinical goals. The resident PCP uses applied knowledge to problem-solve, assisted by the clinical expert and the entire interdisciplinary team. Issues of health literacy, access, non-adherence and disparity are explored, along with evidence-based approaches to care. Residents are assessed for general knowledge, orientation to team care and systems based practice.

3. Self Management Support Skill Session. This small group workshop, led by a clinical psychologist, uses role play and self management goal tools to introduce residents to the inclusion of effective patient activation for self care during regular office visits. Residents are observed using these skills and given specific feedback by a team member. Patient visit surveys provide residents a patient's perspective on their skill level.

4. Asynchronous Learning using Podcasts that focus on Chronic Care Skills. Residents in our program face time constraints as an additional challenge with concurrent inpatient schedules along with a Summa-EIP related initiative to reduce duty shifts to no more than 16 consecutive hours. We tested faculty-authored podcasts to train residents in the use of algorithms for intensified diabetic care. The podcasts are available from any internet-accessible computer, are 10–12 minutes in length, authored by the clinical expert and include a knowledge capture test. A sample is available at http://meded.summahealth.org/viewpodcast.asp. We were pleased to find that all residents and staff have enhanced their knowledge base readily via this medium and therefore continue to add new content to our podcast library.

"I don't feel alone now when I'm trying to see these patients with long term illness. I don't dread their appointments because there is a team working with me."

Resident Evaluation of the Curriculum

Residents are asked to complete a self evaluation on their team-based skills at the end of the revised ambulatory rotation. These rating forms are used to measure progress in moving from Novice to Expert by the third year of residency. Resident evaluations of the educational experience have shown a strong consensus that the rotation is a valuable learning experience. Evaluation results indicate that 78% of the residents strongly

Figure 2

Planned Visits: Impact on Process of Care

Pilot Project (110 diabetic patients)

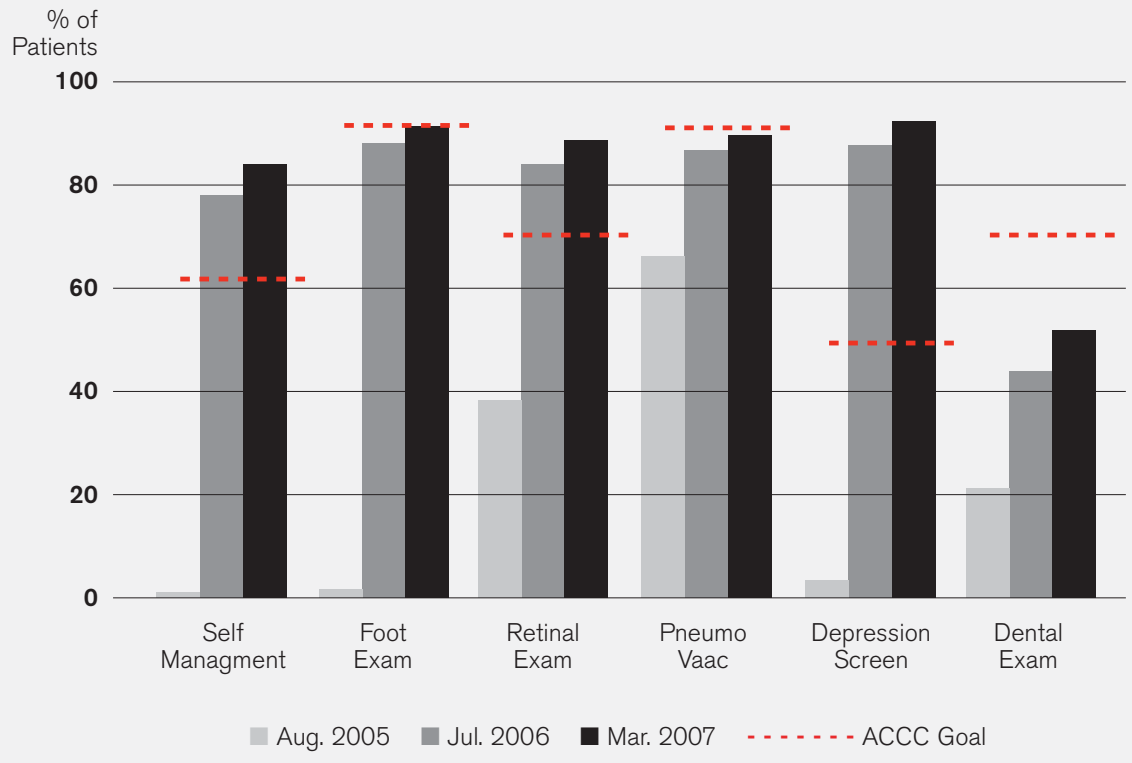
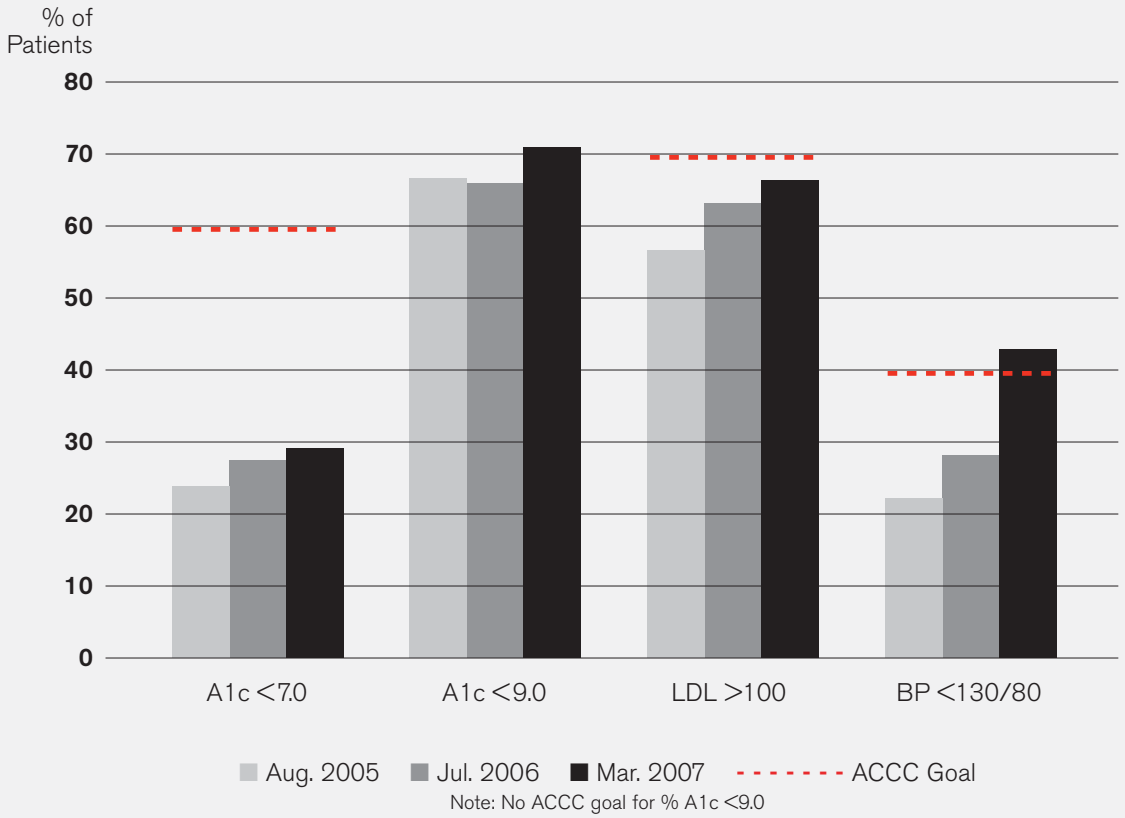


Figure 3

Medication Intensification: Impact on Clinical Outcomes

Pilot Project (110 diabetic patients)



Note: No ACCC goal for % A1c <9.0

agree that they have gained new knowledge in team based care during the rotation and 89% strongly agree that they are using these skills on other rotations. One PGY-3 resident summed up her experience in this way: "I became more aware of the patient's role in the management of their own chronic illnesses. I also gained confidence in myself as a health care provider as well as an educator to my fellow residents and students." A PGY-1 resident described behavioral change from the rotation as: "[I am] much more aware of what to do with my diabetic patient. [I] feel more organized and able to address multiple diabetic issues in a shorter period of time."

"Evaluation results indicate that 78% of the residents strongly agree that they have gained new knowledge in team based care during the rotation and 89% strongly agree that they are using these skills on other rotations."

Discussion and Future Directions

The strength of the Chronic Care Model and its ability to positively impact the way that future physicians are trained is evidenced by its incorporation into the EIP by four of the IM teams in the ACCC (Southern Illinois University, Duke, Summa and University of Cincinnati). These programs continue to collaborate and share ideas within the context of the EIP as they proceed with redesign of care delivery systems and refinement of their interdisciplinary curricula for chronic illness care.

At Summa the revised chronic disease curriculum has entered a second year with residents continuing to receive instruction and feedback as they develop greater competence in chronic disease care. Within the scope of the EIP, this curriculum focuses on linking physician competence and high quality patient care. The health system has provided grant funding to the residency continuity clinic. This has allowed installation of a full-featured Electronic Health Record. The

A PGY-1 Resident: "[I am] much more aware of what to do with my diabetic patient. [I] feel more organized and able to address multiple diabetic issues in a shorter period of time."

registry capability of the new information system is being modified to provide reports of quality achievement which can be analyzed by individual residents, by resident firms (subsets of residents who share coverage and patient care) and by the entire continuity site. The faculty group plans to track the financial impact on the health system and regional insurers of Medicaid patients when patients receive coordinated care using the innovations outlined.

By involving residents in care design change with the use of measured outcomes, educational goals have been enhanced to produce graduates trained to think on two levels: the patient they are currently seeing, as well as the quality of care provided by the practice as a whole. The tools and innovations for diabetes care are now being spread to our entire clinic population of 1400 diabetic patients, resulting in a new treatment paradigm for every patient contact within the clinic. Resident interest in using similar tools to treat other chronic conditions is growing, as evidenced by voluntary participation even when other duties are pressing.

There is a general recognition among faculty that the entire culture of patient care in the department has shifted towards outcomes-driven care delivery. In a very concrete way, we are utilizing the tools developed through the ACCC and EIP to engage medical students and residents early in their training to design and test change and learn new strategies to improve the care of the growing number of patients with chronic conditions. ■

Streamlined and Standardized: Value of the Internal Review Process

Edward P. Callahan, MD, MS, Mary Gleason Heffron, PhD, Deborah Simpson, PhD, Mahendr Kochar, MD, MS, MBA

Internal reviews are an excellent opportunity for institutions to systematically improve their residency and fellowship programs. In today's evolving and increasingly complex accreditation environment, a consistent and effective review process that provides value to all participants must be implemented. When this is not done, program directors and institutional leaders may find the process cumbersome and time consuming, without perceived value.

At the Medical College of Wisconsin Affiliated Hospitals we developed a streamlined and standardized internal review process across all programs in the institution.[1] Our goal was to provide a consistent, effective process, valued by both the institution and the programs reviewed. We believe that this model can be used by other academic institutions to improve their internal reviews as well.

Value to the Institution

To obtain an accurate and informative review, our institutional objectives for the new process were as follows:

1. **Standardization of process:** The process for reviewing was standardized for all programs, designed to simulate an ACGME Review Committee (RC) site visit.
2. **Creation of an easily understood, streamlined process:** Teams conducting the review and the directors of the programs being reviewed were clear on how to proceed.
3. **Promotion of team professionalism and communication:** To enable a smooth process, team members needed to be professional (e.g., respectful, holding programs accountable to accreditation standards), and able to effectively communicate with other team members and others involved in the review process.
4. **Identification of areas of non-compliance:** The new process was intended to help teams and programs find areas of the program that were not in compliance with the requirements or issues that could result in a citation.
5. **Forms similar to Program Information Form (PIF):** Questions asked of the program directors under review needed to be similar to those questions asked within their own PIF, so that they could learn the nomenclature of the RC requirements and rehearse PIF preparation.

To gauge the attainment of these goals, surveys were hand distributed to the team members following the review and to all 18 directors whose programs were reviewed since the streamlined and standardized process was initiated. Potentially three members of each team could respond (for a total of 54). Both team members and program directors were asked about the attainment of goals 1–4 listed above and were asked to comment on how the new process compares to the old one (if they had been part of a review in the past). Additionally, program directors were asked about the fifth goal since it applied specifically to them. One hundred percent of program directors and 74% of team members completed the survey.

"For the first four goals (standardized, streamlined process that is well communicated and identifies areas of non-compliance), the responses from program directors and team members overwhelmingly indicated they felt that the goals had been met."

For the first four goals (a standardized, streamlined process that is well communicated and identifies areas of non-compliance), the responses from program directors and team members overwhelmingly indicated they felt that the goals had been met. The results for the fifth goal (similarity of forms to PIF) also indicate that the program directors perceive that this goal is being achieved **(Exhibit 1).**

The new process is easy to understand, ensures that programs can practice for their site visits (both logistically and through paperwork), exhibits professionalism and communication, and identifies problem areas that could result in a citation if not adequately addressed before the next RC visit. Narrative responses regarding the new versus old review process revealed that both team members and program directors perceived the new process as more effective, efficient, helpful, and similar to an RC site visit compared to the previous review approach.

Value to the Program Directors

Changes in our review process also occurred in response to the needs and values of the program directors being reviewed. Twelve programs have been reviewed using the streamlined process and are now 6 months or more past their internal reviews. The director for each of the programs was

Exhibit 1

Survey of Internal Review Team: Percentage Agreement with Each Statement
40 Team Members

	Strongly Agree/ Agree	Strongly Disagree/ Disagree	Don't Know
1. Protocol clearly explained review process	100%	0%	
2. Schedule effectively mimicked an RC visit	73%	0%	27%
3. Team members worked and communicated well	98%	0%	2%
4. Team able to identify compliance/non-compliance	100%	0%	

Survey of Program Directors: Percentage Agreement with Each Statement
18 Program Directors

	Strongly Agree/ Agree	Strongly Disagree/ Disagree	Don't Know
1. Protocol clearly explained review process	100%	0%	
2. Schedule effectively mimicked RC visit	78%	11%	11%
3. Review conducted in professional and collegial manner	100%	0%	
4. Internal Review able to identify compliance/non-compliance	83%	11%	6%
5. Information on self-review consistent with PIF	100%	0%	

Exhibit 2

Program director questions and interview responses (Percentage agreement)

12 program directors

1. What do you feel is the purpose and value to you as a program director and/or to your program of participating in an internal review?
    - Self-appraisal/insight/identify weaknesses and how to correct them (100%)
    - Objective look from outsider perspective (58%)
    - Prepares you for your site visit/PIF (58%)

2. How well do you feel the process has prepared you for your next site visit?
    - Very well – process was practice for site visit (100%)
    - Identified where work needed to be done (33%)
    - Helps get documentation organized (25%)

3. What, if any, changes have you/your program made since the internal review?
    - Changed didactics (58%)
    - Changed assessments (42%)
    - Changed goals and objectives to be in the language of the general competencies (42%)

interviewed to obtain more detailed perspectives on the new internal review process. A semi-structured interview protocol was developed consisting of open-ended questions to allow each program director to comment freely on the internal review process **(Exhibit 2).**

Program directors' responses were congruent across all questions. Overall, they reported that the review process was valuable, helping them to self-appraise and practice for their next site visit. As "outsiders", they saw the review team as objective, helping them to identify specific targets to be accomplished prior to the accreditation review. In response to their reviews, program directors implemented changes in their programs, including enhancements to their curriculum and assessments and approaches to meeting the requirements related to the general competencies.

Program directors perceive that the internal review has achieved the goals of streamlining and constructive feedback that guide program improvement. Specifically, the program directors value the review process and the recommendations for change. By creating a process that simulates a site visit, program directors become familiar with the language of the ACGME, identify potential citations, and prepare to meet competency and other requirements.

Summary: A Valuable Model

Internal reviews are a necessary component of institutional programs. At the same time, it is difficult to provide useful reviews across multiple residencies and fellowships, as illustrated by the frequency of institutional citations related to the internal review process.[2] Based on feedback from internal review team members and residency program directors, our model provides a process that creates value for both the institution and the programs reviewed. In addition, it has provided our institution with a consistent, systematic approach to internal reviews. We intend to continually measure the effectiveness of the process using surveys and interviews as well as tracking accreditation length over time.

Institutions wishing to develop a similar model for their own internal review process can request the forms from the Graduate Medical Education Office of the Medical College of Wisconsin. ■

Edward Callahan, MD, MS is the Chair of the Internal Review Committee for the Medical College of Wisconsin Affiliated Hospitals (MCWAH) and program director of Emergency Medicine. He is an assistant clinical professor at the Medical College of Wisconsin (MCW). Mary Heffron, PhD is a medical education specialist for MCWAH. Deborah Simpson, PhD is an associate dean and professor at MCW in Academic Affairs. Mahendr Kochar, MD is senior associate dean for graduate medical education at MCW and the designated institutional official for MCWAH.

[1] Callahan E, Gleason Heffron M, Simpson D, Kochar M: Streamlined and Standardized: Rethinking the internal review process to improve compliance across specialties. ACGME Bulletin; December 2005.

[2] ACGME Institutional Requirements: Institutional Citations, 2002-2005: http://www.acgme.org/acWebsite/irc/irc_citations.pdf.

The Program Director – A Competency-Based Job Description

David J. Capobianco, MD, Henry J. Schultz, MD

What knowledge, attitudes and skills do program directors need to effectively carry out their responsibilities? We suggest that the acronym "motivated educators" aptly identifies and describes the many roles of the program director, more specifically:

M – Manager
O – Open to new ideas
T – Thoughtful
I – Innovative
V – Visible
A – Approachable
T – Troubleshooter
E – Empathetic
D – Disciplined (disciplined people, disciplined thought, taking disciplined action)

E – Engaged
D – Diplomatic
U – Understanding
C – Counselor
A – Advocate
T – Teacher
O – Organizer
R – Resourceful
S – Scholarship

The authority and responsibilities of program directors have gradually expanded over the past twenty-five years since the founding of the Accreditation Council for Graduate Medical Education (ACGME). In February 1999, the ACGME raised the bar by challenging program directors to organize residency programs around six general competencies important to physician practice. A roadmap with four distinct phases created clearly defined expectations for the graduate medical education (GME) community.[1] The ultimate goal, phase 4, is to identify benchmark programs as models for other programs in competency-based education and outcomes-based assessment. Yet, high-quality training programs do not exist in isolation. David Leach stated, in a recent JAMA commentary, "High-quality learning is impossible in the absence of high-quality patient care; likewise, high-quality patient care is impossible without high-quality learning."[2] We would add that excellence in patient care, education, and research are inextricably intertwined. "Without research, knowledge does not move forward. Without education – the sharing of that knowledge – patient care does not advance."[3]

As program directors, how do we become competent or proficient in our role as educators and educational administrators? The sage advice of Jim Collins, an educator to leaders throughout the corporate and social sectors, captures key elements: "Greatness (excellence) is not a function of circumstance. It is a function of conscious choice, and, above all, discipline. Disciplined people, disciplined thought, taking disciplined action."[4]

One may frame the requisite knowledge, skills and attitudes of the program director by applying the lens of the ACGME's six general competencies to the program director.[5]

1. Patient Care is translated to: Resident Care and Residency Program Care

The program director is expected to:

- Possess the qualifications to discharge the duties as outlined in the RC clinical specialty and ACGME common program requirements.
- Articulate and promote a program philosophy of patient-centered and learner-focused education based on a competency-based curriculum.
- Administer and maintain an educational environment conducive to educating residents in each of the six ACGME general competencies.
- Ensure that faculty members administer and maintain an educational environment conducive to educating residents in each of the six ACGME competencies.
- Ensure that graduates possess the requisite knowledge, attitudes and skills framed within the lens of the six ACGME competencies to practice competently and independently.
- Define meaningful outcome metrics for residents, faculty and the program.
- Ensure that the program completes and documents a formal systematic self-evaluation at least annually.
- Adhere to the monthly resident program director to-do checklist.
- Administer the residency program with enthusiasm, commitment, compassion and innovation.
- Advocate on behalf of the residents and the program, and be sensitive to and supportive of the faculty.
- Effectively manage accreditation issues for the health and vitality of the program.

2. Medical Knowledge is translated to: Experience and Knowledge in Graduate Medical Education

The program director is expected to be knowledgeable in the following domains:

- ACGME Institutional Requirements.
- ACGME common program requirements and clinical specialty (RC) requirements.
- Accreditation policies and procedures.

- Specialty board certification processes and standards.
- Basics of adult learning theory and application to resident learning.
- Medical education scholarship.

3. Interpersonal and Communication Skills

The program director is expected to:

- Listen to residents, allied health and faculty and respect their views.
- Communicate effectively with applicants, residents and faculty.
- Communicate effectively with institutional GME leadership, clinical specialty organizations, and national organizations, including the ACGME, NRMP and the ABMS specialty board.
- Network within and across institutions.
- Serve as counselor, adviser, liaison and advocate for residents.
- Communicate clearly in the role of the teacher to assess the educational needs of learners, and collaboratively set realistic learning expectations with learners.
- Identify and eliminate barriers in teaching and maintain appropriate balance between patient care and education.
- Offer, seek and accept honest, constructive and timely feedback.

4. Professionalism

The program director is expected to:

- Subordinate his/her own interests to those of the residents and the program.
- Adhere to high ethical and moral standards.
- Demonstrate and practice the core humanistic values – honesty, integrity, caring, compassion, altruism, empathy, respect for others, trustworthiness.
- Exercise accountability.
- Deal with complexity and uncertainty.
- Respect and encourage residents to be actively involved in educational aspects of the program.
- Respect and protect confidential information.
- Maintain up-to-date in his/her knowledge and skills in the domains of education, administration and the clinical specialty.
- Recognize limits of his/her own competence.
- Work with colleagues in a manner that best serves residents' interests.
- Respect the residents' and faculty's cultural beliefs, practices and language.

5. Practice-Based Learning and Improvement

The program director is expected to:

- Demonstrate continuing commitment to excellence and scholarship, particularly medical education scholarship and medical education administration.
- Remain current with evolving program requirements – institutional, clinical specialty and those involving national organizations.
- Participate actively in the specialty's program director society.
- Remain current and anticipate trends in GME.
- Maintain the program director's monthly portfolio – link to the ACGME six general competencies.
- Critically evaluate the program's effectiveness, at least annually.
- Improve the program by incorporating feedback and networking within and across specialties and institutions.
- Lead and facilitate faculty development, particularly as related to competency-based education and outcome-based evaluation.

6. Systems-Based Practice is translated to: Management of Resources

The program director is expected to:

- Ensure the availability of adequate resources for resident education.
- Ensure that resources are provided for resident participation in scholarly activities.
- Ensure that faculty evaluates resident performance for each educational experience and documents the evaluation.
- Ensure that the attributes of a residency program are explicitly defined: resident performance, program quality, faculty development, graduate performance.
- Anticipate potential threats to the program's health (both internal and external).
- Create an atmosphere of mutuality and respect through resident and faculty participation and involvement in decision-making.
- View every challenge as a potential opportunity for improvement.

Conclusions

Program directors do not function in a vacuum. To reach our goal, we must collaborate, cooperate and communicate, not only within our own institutions, but across the GME community. It is imperative that we establish a community of program directors/medical educators to develop and share best practices. Our supporting institutions and regulatory agencies need to recognize and embrace innovation and excellence in medical education. "We must begin to provide medical educators with professional and financial support, or we risk losing talented teachers."[3] Finally, our institutions must provide program directors – motivated educators – the time needed to appropriately discharge their duties and responsibilities. ■

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Evaluating the Six General Competencies in theOutpatient Setting

Robert McDonald, MD, Adrienne Z. Ables, PharmD, Otis Baughman, MD, Patricia Bouknight, MD, Ginger Boyle, MD, Mark Godenick, MD, Jay Grace, PhD, Robert Houston, MD, Ron Januchowski, DO, Lynn Page, LISW, Ifekan-Shango Simon, MD, Petra Warren, MD

The ACGME has set standards for use of six general competencies in the education of residents and fellows. As educators, we have been challenged to develop ways to teach and instill these principles in our residents. It is our task to give feedback and evaluate our residents, in an objective manner, as they progress through their training. Many old and new tools have emerged to evaluate resident progress in each of the general competencies. At Spartanburg Family Medicine Residency Program (SFMRP), we have incorporated many of these evaluation tools in our program and altered those already in use to meet these new requirements.

One of our goals was to create a tool for use in the outpatient setting that would evaluate resident performance in all six general competencies. Because of the confines of a busy outpatient setting, we chose to develop a short, practical tool that would concentrate on only one competency for one resident per half-day clinic session. The tool was developed knowing that residents' performance goals differ for each level of training.

To make this more specifically objective to each resident's level of training, we developed a tool that took into consideration performance expectations for each level of training and based on each of the general competencies. This process resulted in the development of a form that includes these expectations and provides residents with objective learning goals. The resident develops learning goals using techniques that allow for reflection and improvement of their performance over time. The final version has provided us with a built-in advancement tool.

Twelve to 18 times a year, each resident is scheduled to be evaluated one-on-one with a faculty attending. At the beginning of the clinic session, the preceptor notifies the selected resident and reviews the competency goal on which he or she will be evaluated. There is an evaluation calendar posted in the clinic with this schedule. Residents receive direct feedback from their attending at the end of the clinic session. Each of the general competencies is reviewed at least twice in the course of each year. In the three years of residency training, a resident will have 36 one-on-one outpatient evaluations specific to the six general competencies. **Exhibit 1** is the Medical Knowledge form. **Exhibit 2** (pages 32 and 33) contains the entire evaluation tool in table format.

Exhibit 1

Daily Precepting Form for Medical Knowledge

Resident:	**Attending:**
PGY Level: Date:	Direct observation Standard precepting Video observation

PGY – 1			
Demonstrates basic science knowledge and skills.	PM	ME	EE
PGY – 2			
Demonstrates evidence of logical, systematic thinking			
in clinical situation (investigative thinking)	PM	ME	EE
PGY – 3			
Develops, uses, presents, and documents an organized follow up plan including review of labs, tests, etc. (analytical thinking)	PM	ME	EE
Additional Attending Comments:			

Resident Reflective Comments:
How does this affect my education?

What am I going to do based on this information?

Attending Signature	Resident Signature

PM – partially meets ME – meets expectations EE – exceeds expectations

The "One Resident/One Competency" forms are reviewed again at scheduled quarterly sessions with the resident's faculty advisor. Advancement within each of the competencies is easily measured as the resident masters the progressive objectives of each competency. Reflective comments are reviewed and residents are encouraged to set their own goals for continued improvement.

Of interest are the reflective comments made by the individual residents. Examples of some of their comments include: "There is room for improvement in my history taking skills," "I need to start working on developing a more therapeutic relationship with my patient," "I will adjust my plan to meet the patient's financial situation," "It is important for me to be a good example to my patients, colleagues and medical students," and "I need to learn to organize and prioritize complex patients." We have found the reflective piece, or what Epstein called "Mindful Practice"[1] to be particularly useful. It is during this process that the resident brings to consciousness the experience with his or her patients in the context of that day's competency. In so doing, the resident becomes more aware of both the positive aspects of their interactions and those areas that need further improvement.

This tool has proven to be both user-friendly and highly pertinent. Compliance has also proven to be excellent. Residents and attending physicians have liked the immediate feedback given at the end of the clinic session. The reflective portion has been useful to the residents and has encouraged them to take a more active role in their learning.

With the use of this tool, our resident familiarity and understanding of the six general competencies has increased dramatically. Residents are also more likely to ask for their evaluations with each opportunity and have overall become more active and eager in the evaluation process. All in all, this outpatient evaluation tool has provided our program with a timely and objective measurement of all six general competencies and promoted our residents to become more active learners. ■

[1] Epstein, RM. "Mindful Practice," JAMA 1999; 282(9):833-9.

Exhibit 2

The One Resident/One Competency Table

General Competencies and PGY status	Score			Comments
Medical Knowledge				
PGY 1				
Demonstrates basic science knowledge and skills.	PM	ME	EE	
PGY 2				
Demonstrates evidence of logical, systematic thinking in clinical situation (investigative thinking)	PM	ME	EE	
PGY 3				
Develops, uses, presents, and documents an organized follow up plan including review of labs, tests, etc. (analytical thinking)	PM	ME	EE	
Patient Care				
PGY 1				
Adequate information gathering	PM	ME	EE	
Completes and documents a systems based exam	PM	ME	EE	
Demonstrates organized thinking in presentation, patient care and documenting	PM	ME	EE	
PGY 2				
Develops and carries out a differential diagnosis and management plan	PM	ME	EE	
Demonstrates awareness of family dynamics on patient's health and management of disease	PM	ME	EE	
PGY 3				
Counsels and educates patient and families	PM	ME	EE	
Skillfully performs medical procedures	PM	ME	EE	
Provides environment that maximizes continuity of care	PM	ME	EE	
Professionalism				
PGY 1				
Altruism (Shows concerns and compassion)	PM	ME	EE	
Accountability (Appropriate dress/ Arrives on time/ Timely completion of EMR	PM	ME	EE	
Integrity (Maintains confidentiality/ Admits errors/ Truthful documentation)	PM	ME	EE	
Respect for others (Treats patients as individuals/ Respect for staff, peers, and faculty/F I S H principle	PM	ME	EE	
PGY 2				
Altruism (Offers to help)	PM	ME	EE	
Excellence				
Actively seeks precepting (Openness and willingness to learn)	PM	ME	EE	
Respect for others (Does not show or encourage disruptive behavior)	PM	ME	EE	
PGY 3				
Excellence (Actively teaches)	PM	ME	EE	
Duty/Responsibility (Shares team workload fairly/Positively perceives responsibilities/Reports errors or inappropriate behaviors	PM	ME	EE	

PM – partially meets ME – meets expectations EE – exceeds expectations

Exhibit 2 (continued)

The One Resident/One Competency Table

General Competencies and PGY status	Score			Comments
Interpersonal Communication Skills				
PGY 1				
Demonstrates good introductory and proper history taking skills	PM	ME	EE	
Demonstrates appropriate interaction with patients, and health care team	PM	ME	EE	
PGY 2				
Develops therapeutic relationships with patient	PM	ME	EE	
Develops good working relationships with fellow residents	PM	ME	EE	
PGY 3				
Participates in staff education	PM	ME	EE	
Demonstrates purposeful listening	PM	ME	EE	
Practice-Based Learning and Improvement				
PGY 1				
Efficient and effective use of EMR	PM	ME	EE	
Use of EBM resources to answer clinical questions	PM	ME	EE	
Demonstration of information retrieval skills	PM	ME	EE	
PGY 2				
Self-evaluation of own practice using chart review	PM	ME	EE	
Use of evidence based medicine	PM	ME	EE	
Daily self-evaluation	PM	ME	EE	
PGY 3				
Teach junior residents to do all of the above (lead "huddle time") Systems-Based Practice	PM	ME	EE	
PGY 1				
Demonstrate cost effective care	PM	ME	EE	
Advocate for patients within the system/patient's resources/system resources/patient barriers	PM	ME	EE	
PGY 2				
Know what services, referrals, treatments, modalities, and community support services are available and how to use these effectively	PM	ME	EE	
PGY 3				
Demonstrate the coordination of care between other healthcare providers and the patient.	PM	ME	EE	

PM – partially meets ME – meets expectations EE – exceeds expectations

Assuring Physician Competency in Patient Safety

Julie K. Johnson, MSPH, PhD and Sheldon D. Horowitz, MD

Introduction

Patient safety continues to be center-stage in our efforts to improve the quality of patient care. The American Board of Medical Specialties (ABMS) has recognized the importance of competency in safety for all physicians – those seeking initial certification, recertification, or maintenance of certification – and has accordingly modified its certification requirements to promote competence in practice performance, including self-assessment and quality improvement. Realizing the lack of tools and resources for physicians to learn key concepts of patient safety and apply them in their own practice settings, the ABMS embarked on a two-year project to develop a state-of-the-art web-based learning and improvement module.

In the spring of 2007, ABMS launched the Patient Safety Improvement Program (PSIP), which is a web-based patient safety education and quality improvement module designed for physicians to learn essential knowledge, skills, and attitudes about safety and apply them to improve care in their own clinical environment. The PSIP integrates innovative learning strategies to promote patient safety concepts and facilitate practice improvement.

Module development was based on the belief and understanding that there are essential core elements that every physician should know about patient safety. Furthermore, these core elements cut across physician specialty and level of training to build the foundation for a common patient safety and quality improvement language. The ultimate goal is to accelerate the potential for care to be safer for all patients by presenting physicians with engaging patient safety scenarios, synthesizing key patient safety and quality improvement curricula, and providing interactive performance measurement and improvement activities. While designed for board-certified physicians to meet the requirements of Part 4 of the Maintenance of Certification (MOC) process, the PSIP is equally useful for resident education and academic faculty development in the competencies pertinent to patient safety, with an emphasis on practice-based learning and improvement (PBLI) and systems-based practice (SBP). The program was designed specifically to address these two core competencies. As faculty members continue to look for ways to integrate the core competencies into their residency programs, the PSIP offers a promising tool to address this need, especially for PBLI and SBP – the most challenging of the core competencies to teach and assess.

In addition, specific efforts are currently underway to adapt the model for other health professionals. This will provide an opportunity for educating the team on key safety concepts and engaging the team in safety improvement efforts.

Exhibit 1

Overview of ABMS Patient Safety Improvement Program

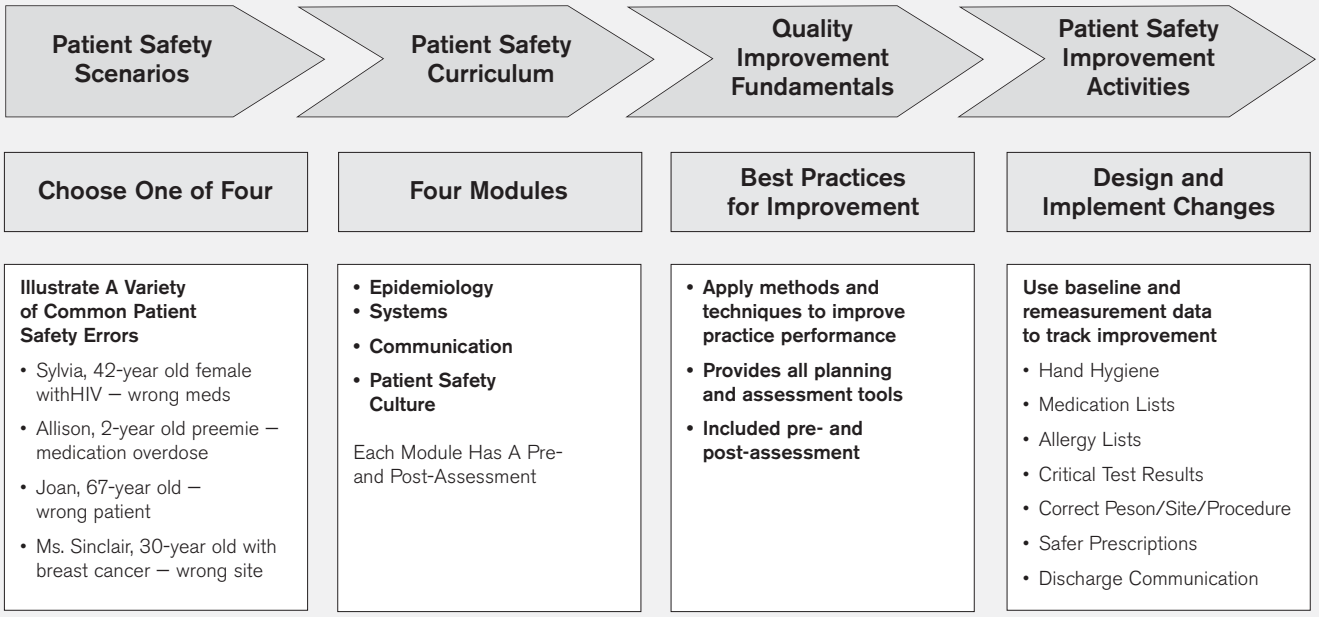

Exhibit 2

Improvement Activities

	Primary Care	Proceduralist/ Surgery	Consultative Practice	Non-Practicing
Hand Hygiene for physicians with routine, direct physical patient contact	✓	✓	✓	
Medication Reconciliation for physicians providing longitudinal patient care that includes medications	✓		✓	
Allergy List for physicians providing longitudinal patient care that includes medications	✓			
Critical Test Results Communication for physicians who receive or provide test results requiring immediate action (laboratory, pathology, radiology, etc.)	✓	✓	✓	✓
Correct Site/Patient/Procedure for physicians routinely performing major invasive procedures (surgery, interventional radiology, etc.)		✓	✓	
Safer Prescription and Order Writing for physicians routinely writing medication prescriptions or orders	✓	✓	✓	✓
Discharge Planning for physicians routinely involved in patient discharge (inpatient)	✓	✓	✓	

Program Overview

Exhibit 1 illustrates the four core elements of the ABMS Patient Safety Improvement Program:

1. *Patient safety scenarios* that highlight key themes of patient safety that cut across disciplines and specialties (e.g., medication errors, handoffs, teamwork).
2. *Patient safety curriculum* that flows directly from the scenarios and encompasses four broad categories – Epidemiology, Systems, Communication and Safety Culture. Each category includes several subcategories, which were arrived at via research of current web-based patient safety tools, a literature review, and consultation with ABMS member boards.
3. *Quality improvement fundamentals* include what the participant needs to know to make improvements in practice.
4. *Patient safety improvement activities* that introduce changes the individual physician can make in his/her own practice setting (e.g., daily goals, hand hygiene, and medical reconciliation). Physicians are expected to enter baseline data, make changes in practice, and enter additional data to reflect the result of the improvement effort. **Exhibit 2** details the improvement activities offered in the program and maps the activities to categories of specialties (i.e., primary care, procedure-based specialties and surgery, consultative practice, and non-practicing physicians who wish to maintain their certification).

Overall, the ABMS Patient Safety Improvement Program provides an educational experience that incorporates key patient safety topics, methods of assessment, case scenarios as learning examples, and improvement activities for individual physician practices. Incorporating measurement into this educational effort distinguishes this module from existing on-line educational modules for physicians. Upon successful completion of the online program, which includes pre- and post-test assessments of each curriculum module and a completed improvement activity, clinicians receive CME credit. See http://www.abms.org/Products_and_Publications/ for additional information and to access an online demo.

Exhbit 3

Advisory Panel Members

Peter B. Angood, MD	Kerm Henriksen, PhD
James P. Bagian, MD, PE	John Hickner, MD, MSc
Paul Barach, MD, MPH	Lucian Leape, MD
David W. Bates, MD, MSC	Eric Marks, MD
Eric Coleman, MD, MPH	Marlene Miller, MD, MSc
David M. Gaba, MD	Ajit K. Sachdeva, MD
Paula Griswold, MS	Niraj L. Sehgal, MD, MPH

The development of the ABMS Patient Safety Program was guided by a blue ribbon panel of subject matter experts in patient safety and quality improvement. **Exhibit 3** lists those who have served as the Advisory Committee throughout the entire process.

Conclusion

The role of the certifying boards is to assure the public of the ability of certified physicians to deliver quality care. This implies that physicians are able to assess the quality of care they deliver and also to improve that care. The American Board of Medical Specialties (ABMS) and the Council of Medical Specialty Societies (CMSS) have committed to "developing and evaluating programs that educate and assist physicians in assessing and improving the safety of the care they deliver" (ABMS-CMSS Joint Planning Committee, December 2002).

By developing the Patient Safety Improvement Program, the ABMS boards and their professional societies enable physicians to demonstrate to the public, their patients, colleagues and the boards that they have taken an important step in acquiring the knowledge and skills to assess the safety of the care they deliver and to make care safer. The intent is for this module to be integrated with local patient safety efforts that involve physicians in addressing the culture for safety and system issues related to providing safe care. Completion of the ABMS PSIP will be an important first step in assuring that physicians have the basic knowledge about safety and improvement science to improve patient safety. ■

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The ACGME Approves Revisions to Program Requirements

At the June 2007 meeting, the ACGME approved major revisions to the program requirements for in Obstetrics and Gynecology, Surgery and Thoracic Surgery, all effective January 1, 2008.

The ACGME also approved revisions to the program requirements for Endovascular Surgical Neuroradiology, a subspecialty of Neurological Surgery and Diagnostic Radiology, also effective January 1, 2008.

ACGME Begins Process of Recognizing Pediatric Transplant Hepatology

The ACGME is beginning the process of reviewing the justification and proposed program requirements for Pediatric Transplant Hepatology, as a future additional subspecialty of Pediatrics.

Other News from the June ACGME Meeting

No Increase in Accreditaion Fees for 2008

The ACGME Board of Directors accepted the recommendation of the Finance Committee to keep the acreditation fees stable for 2008. This will make 2008 the fourth consecutive year for which there will be no increase in the ACGME's accreditation fees.

ACGME Revises Policies and Procedures Making Both ACGME Resident Directors as Members of the Council of Review Committee Chairs

Dr. Hartmann, Chair, Bylaws and Policies Committee, requested, and the ACGME approved a change in the ACGME Policies and Procedures that makes the two ACGME Resident Directors members of the Council of Review Committee Chairs.

IRC and TYRC Appoint New Members

Linda Boerger Andrews, MD, Associate Dean for Graduate Medical Education, Baylor College of Medicine, Houston and Christopher Veremakis, MD, Director, Graduate Medical Education, St. John's Mercy Medical Center, St. Louis, were appointed to the Institutional Review Committee.

William Francis Iobst, MD, Designated Institutional Official, Lehigh Valley Hospital, Allentown, has been appointed to the Transitional Year Review Committee. ■

National and International News of Interest

National Institutes of Health Planning to Fund Exceptionally Innovative Research

The National Institutes of Health (NIH) has announced a new program to fund studies that seek to test innovative, unconventional hypotheses, and responses to technical and methodological challenges. The aim is to fund innovative studies that would have a high impact in areas in keeping with the mission of one or more NIH Institutes. The EUREKA program will fund direct costs up to $800,000 over four years. Collectively, participating NIH institutes will make more than $8 million available to fund innovative research.

Application Process for Clinical Programs Creates Problems for UK Junior Doctors

Since May 2007, the medical and general press in the United Kingdom has been filled with reports of the failure of the UK Department of Health's web-based Medical Training Application Service (MTAS), which was instituted in the fall of 2006 to assist in selecting UK junior doctors (resident physicians) to clinical education programs. The MTAS program suffered from technical problems that made use of the on-line system difficult, but the more profound issue was the system's apparently flawed process for evaluating the qualifications and experience of the applicants, which may have prevented qualified junior doctors from being selected for training positions. Junior doctors who did not get selected for interviews in the first round of the system sought to obtain their scores, but the Department of Health refused to reveal them, citing that the MTAS is a type of examination, and scores need not be revealed until the process concludes after a second round of interviews.

The MTAS system was abandoned in May, but problems continue to mount for a possible 34,000 junior doctors who may be affected by the failure of the system.

A Brief History of MTAS

April–September 2006: The MTAS system is being implemented at a cost of 6.3 million British Pounds.

June 2006: The British Medical Association warns that many junior doctors may face unemployment as a result of MTAS

March 2007: Doctors in Birmingham refuse to conduct junior doctor interviews on the ground they are unfair, the UK Government announces a review of the system and 12,000 junior doctors protest in London

May 2007: The MTAS system is discontinued, and search for another system to evaluate junior doctors begins. ■

Innovation in the Learning Environment: An Emerging Typology

Ingrid Philibert, MHA, MBA

In September 2007, the ACGME Committee on Innovation in the Learning Environment (CILE) will present the final version of its first report to the ACGME Board of Directors. The report encompasses a host of initiatives designed to stimulate innovation in the learning environment through the accreditation process and related activities. This has stimulated interest in exploring a typology of innovation in the learning environment, adapting and expanding concepts from work in business and the social sciences. A 1994 review of the literature in innovation found more than 20 different definitions of innovation, but ultimately reduced it to four key characteristics:[1]

1. innovation represents newness, either the first known use of a particular process or change, or the first use of a process or change in a particular setting or institution;
2. innovation is not the same thing as invention; the latter is concerned with discovery of new approaches, while innovation focuses on application in functional settings;
3. innovation refers both to the process and the outcome;
4. innovation involves discontinuous change, differentiating it from ongoing, organizational improvement efforts.

Working Taxonomy

The characteristics are important to classifying an intervention as "innovation," yet the complexities of the learning environment and the co-existence of patient care and education and potential targets of innovation make it useful to develop a working taxonomy of efforts. A considerable number of classifications of innovation exist in the literature. For example, Osborne proposed a new clarification of innovation into four categories: 1. architectural innovation, which changes both the markets for a product or service and their production (radical change); 2. regular innovation, which refines existing production processes and markets (incremental change); 3. niche creation innovation, which creates new markets and uses for existing products and services; and 4. revolutionary innovation, which applies new ideas to the production of existing products and markets.[2]

Exhibit 1 represents an initial effort at trying to categorize innovation in the learning environment. The typology is simple, and considers just two aspects of an innovation: 1. the aspect of the learning environment that is targeted; 2. where the innovation originates within the micro- and macro-systems that comprise the learning environment. Unlike other typologies of innovation, this simple approach does not consider whether innovation results from the availability of

Exhibit 1

An Emerging Typology of Innovation in the Learning Environment

Target	
• Care Process Innovation • Innovation in Teaching and Learning • Innovation in Assessment • Structural Innovation (Innovation to change aspects of the structural environment of care and learning) • Process Innovation (Innovation to increase efficiency/reduce burden) • New Customers or Markets	
Origin	
Top Down Innovation, initiated by the institution	**Advantages:** Larger scope, institutional support, deeper deployment to all health professionals in the setting **Drawback:** Often cannot be tailored to the needs of residents, other learners; residents may be excluded or marginalized
Bottom Up Innovation, originating from the education program or an individual resident/fellow	**Advantages:** Customized to the need of learners, can provide data on impact of resident care **Drawbacks:** Resource and support intensive, lack of deployment to other providers or settings of care
Adaptive, in response to external changes, such as standards limiting resident duty hours	**Advantages:** Revamps and optimizes processes in response to external change **Drawbacks:** Impetus and potentially control are external, innovation may be perceived as "reactive," not "proactive"
Transfer innovation, applying processe from other industries (e.g., Toyota Lean Production) to the learning and patient care environment	**Advantages:** Introduces new approaches that have been proven in other settings **Drawbacks:** Adapting processes from manufacturing and other industries to the learning and patient care environment can be difficult and/or require systemic changes that may present major challenges, particularly if the change is initiated by the residency program

new technology, processes or modalities. This is because the focus is on the "pull" of the interest to improve patient care and learning, not the "push" exerted by new technology or approaches. This does not preclude the solution to a given need to be new technology or a novel approach. An example is that technology like simulation can be used to facilitate resident learning or can be used to improve the safety of care. An important consideration is the origin, and thus to some extent, the locus of control for innovation, because it is important to consider whether innovation is locally initiated, or whether it occurs in response to environmental factors that necessitate change in established practices, such as the ACGME setting common duty hour standards for all accredited programs.

There are other ways in which the origin of innovation is important. Efforts to include residents in institution-wide and institution-initiated improvement efforts are different from innovation originating from the residency program itself. An example of the "Top Down" care process innovation is an institution's participation in the Institute for Health Care Improvement's (IHI's) 5 Million Lives Campaign to improve the effectiveness and safety of care.

In the top-down variant of innovation in the learning environment, residents are included in institution-initiated interventions. An example is resident involvement in the quality improvement efforts in the Institute for Healthcare Improvement (IHI) 100,000 Lives Campaign. Initiated in 2004, this national campaign ultimately has engaged more than 3,000 US hospitals in an effort to adopt six evidence-based interventions that reduce mortality and morbidity (Rapid Response Teams; Evidence-based care for Acute Myocardial Infarction; Preventing Adverse Events; Central Line Infections; Surgical Site Infections and Ventilator-Associated Pneumonia).[3] In 2006 the IHI expanded the campaign, adding several new interventions, including a number germane to resident practice (Preventing Harm from High-alert Medications; Reducing Surgical Complications; Methicillin-resistant Staphylococcus Aureus Infection, and Delivering Reliable, Evidenced-Based Care for Congestive Heart Failure) and changed the name to the 5 Million Lives Campaign. Participation in institution-level clinical improvement may have a significant effect on residents' preparation to conduct practice-based quality improvement

after completing their education, and large scale efforts like the 100,000 or 5 Million Lives Campaign may provide a meaningful platform.

In contrast, residents using practice improvement modules (PIMS) in their ambulatory clinics, with the intervention initiating from the residency is an example of "Bottom Up" innovation. Some interventions, like the use of PIMS in residency programs, have the potential to have not only a profound effect on resident learning, but also on the quality of the care the residents provide.

Reasons for Creating a Typology of Innovation

What are reasons to create a typology of innovation in the learning environment? First, a typology may clarify the link between these interventions and efforts to teach residents practice-based learning and improvement (PBLI) and systems-based practice (SBP), two of the six competencies required by the ACGME and the American Board of Medical Specialties (ABMS). They are important to physicians' efforts to improve clinical practice at the individual, team and institution level, but may not be optimally taught in traditional education formats. PBLI and SBP can be taught through resident participation in institutional efforts (top-down innovation) or through their involvement in short-term, resident-initiated quality improvement research projects (bottom-up innovation). Bottom-up innovation can be very effective. Ogrinc et al assessed the value of a four-week PBLI elective for internal medicine residents, and found that residents who completed the elective scored higher on the assessments of the ability to apply quality improvement tools, and retained this knowledge at a retest six months later.[4] Ideally, both top-down and bottom-up approaches involve changes in residents' activities at the interface of learning and clinical practice, and thus require innovative interventions in the learning environment.

Even when an intervention has goals completely remote from PBLI and SBP objectives, the associated measurement and improvement, and the resulting enhanced understanding of the systems operating in the learning environment, meet PBLI and SBP learning goals.

A Focus on Sustainability and Outcomes

A second objective for the development of a typology of innovation is to assist in the analysis of existing efforts to innovate in the learning environment, with a focus on sustainability and outcomes. An effort underway by the ACGME Committee on Innovation in the Learning Environment seeks to do just that. It involves a follow-up study on innovative practices in the learning environment reported between 1998 and 2005. A brief web-based survey has been fielded to the lead authors of nearly 200 articles, abstracts and poster presentations, asking about the current status of these initiatives. The goal is to assess why some of the interventions flourished, some were disseminated and replicated in a wider range of settings, while others were not successful and were ultimately abandoned. The survey also asked about what changes were made to the interventions after implementation, and what factors the authors think led to their success, or ultimate disbandment. Articles, abstracts and posters were identified through a search of the literature, and listings of abstracts, posters and presentations from meetings of program directors and medical educators.

The focus is on two sets of factors that contribute to success or failure of an innovation: 1) attributes of the initiative itself; and 2) attributes of the circumstances or the environment in which it was instituted, with the goal of identifying what aspects of an intervention and its environment contribute to sustainability. For the assessment of the first attribute, one could ask whether all innovation should be sustained, or whether some constitute "tests of change," that ultimately are abandoned in favor of a better solution or because they simply do not produce the desired results. True innovation has some rate of failure, which is appropriate given that the goal is to test new approaches for their practicability and value. The published literature alone may not offer a complete answer to this question, since evidence of an initial "track record" may be necessary for an innovation to be acceptable for publication. It is hoped that the sizable numbers of abstracts and poster presentations included in the set of innovations being studied may shed added light on this question.

Assessment of the environment adds another dimension. Innovations with known benefits and practical value may fail if their environment is not conducive to change or does not support them. Preliminary analysis already suggests that initiatives often appear linked to an individual or a small group, who develops, sponsors and nurtures an intervention. Not infrequently, when these key individuals assume other roles or leave the institution, the initiative is vulnerable to being disbanded. A more comprehensive analysis, among other things, will identify the human and systems infrastructure required for an innovation in the learning environment to be sustainable. A related effort is the Learning Innovation and Improvement Project that studies teaching institutions that appear to be particularly successful with innovation in their learning environment.

The guiding thread in all of these linked efforts is a better understanding of innovation in the learning environment, with the goal of assisting residency programs and sponsoring institutions in adopting and replicating new approaches in their setting. Another goal is to allow the ACGME to enhance its ability to promote innovation in the leaning environment, at minimum removing barriers the accreditation standards and processes may present to programs' and institutions' efforts to be innovative. ■

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