MEDICAL TEACHER

The ACGME outcome project: retrospective and prospective

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Abstract

Background: The Accreditation Council for Graduate Medical Education began an initiative in 1998 to improve resident physicians' ability to provide quality patient care and to work effectively in current and evolving healthcare delivery systems.

Aims: This initiative, called the Outcome Project, seeks changes in residency programs that focus education on the competency domains, enhance assessment of resident performance and increase utilization of educational outcomes for improving residents' education. Increased emphasis on educational outcome measures in accreditation is another important goal.

Results: A considerable amount of development, dissemination and educational activity has been carried out to support project implementation. Thus far, observed effects include changes to accreditation requirements and information collection and enhancements of the educational environments and curriculum of residency education programs.

Conclusion: Prospects for meaningful change are good. Further development of assessment methods is needed to advance in-training evaluation of residents and the ACGME goals for utilizing performance data in accreditation and linking education and patient care quality.

Introduction

The Accreditation Council for Graduate Medical Education (ACGME) began its general competency and outcome initiative in 1998. This initiative, called the Outcome Project, requires that US' graduate medical education programs foster resident physicians' development of competencies in six domains and collect performance data that reliably and accurately depicts residents' ability to care for patients and to work effectively in healthcare delivery systems. This approach assumes that quality patient care results when residents acquire and apply competencies effectively.

Changing accreditation is another important goal of this project. Eventually, the ACGME wants its accreditation committees, the Residency Review Committees, to take into account residency programs' educational outcomes when making accreditation decisions instead of relying solely on programs' descriptions of their resources and educational policies and processes. Aggregate resident performance data that illustrates progressive improvement in teamwork, for example, is one way that educational outcome data might be used.

Many graduate medical educators responded immediately to the Outcome Project with enhancements to their educational programs. Achievement of widespread substantive change continues as a challenge still to be accomplished. Activities undertaken to support accomplishment of Outcome Project goals and advances observed thus far are described in this paper.

Practice points

- The ACGME Outcome Project has stimulated widespread, fundamental change in physician education.
- Voluntary activities of numerous medical organizations have contributed substantially to the spread of change.
- Components of the general competency domains are closely aligned with health care quality aims.
- Further enhancement of performance assessment methodologies is required to attain Outcome Project goals and to measure effects.

Initial steps: the general competencies and accreditation requirements

The ACGME and American Board of Medical Specialties (ABMS) jointly identified six domains of general competencies; they are patient care, medical knowledge, practice-based learning and improvement, interpersonal and communication skills, professionalism and systems-based practice. The General Competencies are the cornerstone of the Outcome Project. Table 1 displays the six general competency domains and their current and proposed components (Accreditation Council for Graduate Medical Education 1999).

The competencies were the product of a multi-step systematic development process. First, a list of competencies was compiled from the literature and organized into

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Table 1. ACGME General Competency domains and constituent components.[a]

Patient care

- communicate effectively; demonstrate caring and respectful behavior,
- gather essential and accurate information,
- make informed decisions about diagnostic and therapeutic interventions,
- develop and carry out patient managment plans,
- perform competently medical and invasive procedures,
- provide patient counseling and education,
- use technology,
- provide preventive and health maintenance services, and
- working with other care providers to provide patient-focused care.

Medical knowledge[a]

- obtain biomedical, clinical, social-behavioral and epidemiological knowledge, and
- demonstrate investigatory and analytic thinking.

Practice-based learning and improvement

- identify strengths, deficiencies and limits in one's knowledge and experience,[d]
- set learning and improvement goals,[d]
- identify and perform appropriate learning activities,[d]
- incorporate formative evaluative feedback into daily practice,[d]
- systematically analyse practice and implement changes to improve practice,
- appraise and use scientific evidence,
- use technology to optimize learning, and
- participate in the education of patients, famililes and other health professionals.

Inter-personal and communication skills

- create and sustain a therapeutic, ethical relationships with patients,[b]
- communicate effectively using listening, verbal, non-verbal, questioning, explanatory and writing skills,[b]
- communicate effectively with patients, families and the public,[c]
- communicate effectively with physicians, other health professionals and health-related agencies,[d]
- work with other care providers as a team leader or member,
- act in a consultative role to other physicians, health-related agencies and policy-makers,[c] and
- maintain medical records.[d]

Professionalism

- demonstrate respect, compassion and integrity,
- demonstrate responsiveness to patient needs that supercedes self-interest,
- demonstrate accountability to patients, society and the profession,
- demonstrate excellence and on-going professional development,[d]
- demonstrate adherence to ethical principles,
- demonstrate sensitivity and responsiveness to diverse patient population, and
- demonstrate respect for patient privacy and autonomy.[c]

Systems-based practice

- understand how one's actions affect and are affected by the larger system,[b]
- work in various healthcare delivery or public health settings,[b]
- coordinate patient care,[d]
- incorporate cost awareness and risk-benefit analysis,[c]
- advocate for quality patient care and optimal health care or public health systems,[c]
- work in inter-professional teams to enhance quality and safety,[d] and
- participate in identifying system errors.[d]

[a]Table includes competency components from the 1999 approved language and 2007 proposed General Competency language in the ACGME Common Program Requirements. [b]This component is not included in the proposed 2007 language. [c]This component is included in the proposed 2007 language and is a modification of the 1999 language. [d]This component is new and in the proposed 2007 language.

13 domains. Domain experts provided feedback. A focus group of program directors provided feedback on the revised competency list. Then residents, RRC members and members of the ACGME's Institutional Review Committee rated and ranked the proposed competency domains and components on: (a) how important it is as an element of future physicians' competence; and (b) how important it is for resident physicians to engage in learning activities in the area. External stakeholders appraised the competencies during structured interviews. The ACGME's Outcome Project Advisory Group synthesized and discussed the information that had been collected. The product of their deliberations was a set of six competency domains. Follow-up work entailed reconfiguring the components of the retained domains into the six categories. Further changes were made as the ACGME and ABMS reconciled their organization's competency domains and constituent components.

Next, the Advisory Group drafted a version of the general competencies for inclusion in accreditation program requirements. This version provided a general description of each competency domain. Later on, residency RRCs, specialty organizations, program directors and others would be invited to shape competency language to fit their specialties and local contexts. The ACGME adopted the competency domains and their components and the program requirement version of the general competencies in September 1999. Accreditation requirements that instructed programs to develop specific learning objectives for the competencies, offer education in the competencies and assess residents' learning and performance also were adopted at this time. The ACGME's approval of the requirements effectively lauched the Outcome Project. A flurry of activity immediately ensued as graduate medical educators endeavored to understand the implications of the requirements and to put into place requisite instructional and assessment methods.

The ACGME developed a four-phase timeline that provided for gradual implementation of learning opportunites, assessment and use of data for improvement across 15 years. (Accreditation Council for Graduate Medical Education 2001) Current and future implementation expectations for residency programs are: (1) full integration of the competencies into the curriculum as evidenced by robust learning opportunities and assessment (Phase 2); (2) use of aggregate performance data to assess residency program effectiveness and to identify improvements needed (Phase 2); and (3) linkage of education and patient care quality using external measures such as patient care process and outcome indicators and patient questionnaires (Phase 3).

On-going development and implementation

Integration of the Outcome Project into the accreditation process began with development of accreditation requirements. Another implementation step entailed development of an information reporting form for residency programs. This form, which has enabled electronic data collection, asks programs to report the instructional activities they offer to facilitate residents' development of capabilities in the six

domains, their methods for assessing residents' learning and performance and changes they recently implemented to improve teaching and assessment. Early on a process was put in place so ACGME field staff could verify that the implementation processes the programs reported were being carried out. Data collection and verification began in mid-2002. All these processes will be revised in 2007.

During 2000 and 2001, Residency Review Committee Chairs or selected members of the committees participated in small group activities organized by the ACGME and ABMS to further develop and adapt competency definitions to their individual specialties and to identify assessment approaches. A representative from each specialty's certification board and program director organization and a resident from the specialty also participated in the initial two meetings and follow-up activities. In 2005, similarly constituted groups were convened to discuss assessment approaches that could apply to both resident and practicing physicians and be used for in-training assessment, certification and maintenance of certification. A workgroup of RRC members contributed by identifying a starter set of assessment methods for three of the competency domains. (Accreditation Council for Graduate Medical Education 2002). Their suggestions were based on literature reviews conducted by ACGME staff. More recently, RRC members participated in a development course to facilitate their evaluations of the adequacy of program implementation of general competency and outcome assessment requirements. Periodically, through-out the development process, educational sessions and updates on implementation progress have been provided to ACGME staff, including field staff, and RRC Chairs.

The roll-out of the general competencies and accreditation requirements stimulated interest, confusion and many requests from resident educators. They asked for further explanation of the practical meaning of the competencies, the Outcome Project rationale, criteria for successful implementation and concrete illustrations of ways to foster learning and assess resident capabilities in the six domains. The requests made clear that GME educators needed assistance in: writing goals and objectives, identifying and developing appropriate learning activities, identifying and developing good assessment approaches, identifying performance standards and aligning learning activities and assessment.

The ACGME and its collaborative partners undertook a multi-faceted educational approach to enhance understanding of and engagement in the initiative. ACGME staff delivered over 200 Outcome Project updates and presentations to program director groups, national medical organizations and others in response to requests. Staff facilitated workshops at multi-institutional gatherings of graduate medical education faculty to build practical knowledge for application to curriculum development. Annually from 2001–2006, the ACGME and Institute of Healthcare Improvement sponsored an invitational workshop on Practice-Based Learning and Improvement and one other competency domain. The aim was to develop a well informed cohort of committed educators and advocates.

The Outcome Project has provided enhanced opportunities for GME educators to participate in the education of their

colleagues. Presentations of 'examples from the field' as well as poster presentations have become regular events at the ACGME's expanded annual educational conference. GME educators also have been invited to present posters at annuals meetings on the competencies co-sponsored by the ACGME and ABMS. Special Outcome Project issues of the ACGME Bulletin have featured articles by GME educators. The ACGME website, introduced in 2002, invites and displays examples from the field in which GME educators and institutional officials describe practices implemented as learning opportunities for residents, assessments of residents or faculty development. It also houses a variety of implementation and educational resources, including assessment tools, educational resource booklets, references to scholarly articles and presentations with facilitator guides.

Implementation progress and accomplishments

At this stage in the implementation process, residency programs are expected to have in place competency-related learning objectives, learning opportunities for residents in each of the six domains and methods for assessing residents' capabilities in the six domains. An evaluation is underway to determine the extent to which these expectations have been met. Accomplishments of the Outcome Project, however, are best viewed through a wider lens that captures the range of multi-faceted effects of this national level educational change initiative. A sample of effects observed thus far is described below. This information is derived from tacit knowledge, informal surveys, literature searches and inspection of the ACGME database of educational practices.

Adoption of the General Competencies framework

The General Competencies have become the common language for defining physician competence and the organizing principles for education of physicians in training. The graduate and continuing medical accrediting, certifying and licensure bodies in the US have all adopted the General Competency domains. These organizations oversee the quality of education and performance of resident and practicing physicians.

Widespread engagement of the medical education community

Numerous program director organizations, specialty colleges, societies or academies and specialty certification boards have engaged in activities to support teaching and assessment of the General Competencies. Thus, the Outcome Project can be credited with increasing and focusing the educational development activities of a large number of professional medical organizations. A sample of the activities and products are cited below:

- The American Academy of Allergy and Immunology (2002) has a website of resources for teaching and assessing the competencies;

- The Council of Residency Directors in Emergency Medicine and the American Board of Psychiatry and Neurology identified learning objectives, instructional activities and assessment techniques for the six competency domains and published their work (Academic Emergency Medicine 2002; Scheiber et al. 2003);
- The American Board of Internal Medicine (2004) and Council of Resident Education in Obstetrics and Gynecology (2003) developed assessment tools for use by residency programs;
- The American Board of Family Medicine (2006) developed an electronic portfolio that stores and maintains resident performance information including evaluations and competencies met; and
- The American College of Surgeons (2003) has a task force to lead development and implementation efforts for four of the six competency domains.

Changes in resident learning opportunities and assessment

As part of their reporting requirements for their accreditation review, residency programs describe how they are teaching and assessing the competencies and report changes they have made to improve residents' learning opportunities. Information collected between 2002 and 2006 curently are being analysed. Trends observed thus far are presented below.

Residency programs are:

- revising and expanding learning objectives to reflect the competencies;
- adding learning opportunities for the competencies, most often in the form of new department lectures or conferences; individual or group projects; or lecture, discussion or conference series offered by the institution;
- enhancing performance feedback, in particular by including multi-source feedback and direct observation; and
- engaging faculty in development sessions in order to enhance their understanding of the competencies and to increase their skill in evaluating resident performance and providing substantive feedback.

Numerous programs reported the addition of lectures or conferences to augment residents' knowledge of specialty-specific issues. Enhancements in learning opportunities in other competency areas are more likely to be provided through core curriculum lecture series or computer modules developed by the institution and offered to residency programs in all specialties. These activities are focused on inter-personal and communication skills, professionalism and systems-based practice.

Resident engagement in quality improvement projects and evidence-based medicine activities are frequently reported new additions to the curriculum. The programs report quality improvement projects that entail some or all of the following: resident examination of their own patient care using process and outcome data; literature searches to locate strategies for improving care; and implementation of the strategies. Residents also search the literature for answers to clinical

questions about their patients and facilitate the learning of their patient care team by reporting on their findings.

A large and increasing number of programs are augmenting their assessment of residents by engaging nurses, resident peers, patients, office staff, therapists, technicians or others in performance evaluation of residents. In many of the programs, these multi-source evaluations focus on residents' interpersonal and communication skills and professionalism. More programs are beginning to directly observe residents' clinical performance, concurrently assess it and provide feedback. The American Board of Internal Medicine's Mini-CEX or derivations of this method are commonly reported approaches. Increases in the frequency of resident evaluation are also being reported.

Changes to the learning environment

Enhancements to instructional methods and assessment are one type of change to the learning environment. Other changes have been reported in response to informal polling that asks participants to report effects of the Outcome Project.
Among the reported effects are:

- greater involvement in GME by institutional officials and institutional Graduate Medical Education Committees;
- increased engagement of faculty in education and more faculty development in education;
- increased resources for GME (simulation centers, professional educators and support personnel, electronic evaluation systems);
- increased discussion and thinking about educational issues and the educational process;
- broader perspective on what constitutes a 'competent physician'; increased focus on professionalism, systems issues, safety and communication; and
- more substantive performance feedback to residents.

Changes to accreditation

Changes to the accreditation process were described previously under development and implementation. These changes include program requirements that describe the competencies residents are expected to demonstrate prior to graduation and processes for evaluating residents' learning and performance; data collection forms for programs to use for reporting their teaching/learning and assessment activities; and a site visit review process for verification of information programs provide about their implementation activities.

At the current time, accreditation reviews of program implementation largely are calibrated to ensure that programs are attending to the competencies and exhibiting implementation progress. Consistent with the implementation timeline, the focus of accreditation is still on the processes of teaching and assessing the competencies and does not yet include consideration of programs' educational outcomes.

Looking forward: linking patient care quality and education in the general competencies

From the beginning, resident educators have challenged the ACGME to provide evidence that teaching and assessing the competencies (a) will result in better prepared new physicians and better patient care or (b) has resulted in better new physicians and better patient care. Evidence for the potential of the Outcome Project to have positive effects currently exists. Some of this evidence, which shows that competency components in communication and practice-based learning (i.e. evidence-based medicine, critical appraisal and quality improvement) can be improved through education, has been reviewed elsewhere (Swing 2004). There is also support for the current relevance of numerous competency components. As shown in Table 2, many of the General Competency components are the same as those associated with attainment of the healthcare quality aims the Institute of Medicine (2001) presented in its report 'Crossing the Quality Chasm' as healthcare improvement priorities.

Furthermore, there is evidence that links constituent components or sets of components of the aims to desired outcomes and patient perceptions of care quality. For instance, use of technology, such as physician order entry systems that include medication dosing and selection guidelines improved paitent safety, in particular prescribing and reducing falls among the elderly (Agency for Healthcare Research & Quality 2005). Patient-centered communication creates trust, which in turn is related to patients' disclosure of information (Berrios-Rivera et al. 2006); adherence to medication (Schneider et al. 2004; Piette et al. 2005); and willingness to seek care (Owlsley et al. 2006). Effective communication and teamwork are associated with safe care (Shapiro 2004; Sutcliffe 2004) and efficient care (Overdyk et al. 1998; Friedman & Berger 2004). Thus, by extension, there is reason to believe that residents' acquisition of knowledge and skills associated with the General Competencies prepares them to address important healthcare aims and to improve patient care quality.

Obtaining evidence that links competency-related educational activities, improvements in resident performance and better patient care will be challenging. Among the development and implementation steps needed to gather requisite evidence are: (1) identification or development of assessment tools that are accurate, reliable and sensitive to change; (2) assessment of resident performance before competency-based education and again afterwards; (3) centralized compilation of the performance data, along with information on competency-based education or decentralized compilation of data from numerous large sub-sets of programs; and (4) analyses that examine the relationship of education and resident performance.

Linking patient care quality and education in the competencies is the goal of Phase 3 of the Outcome Project. Assessment and analyses, in addition to that described above, will be required to establish that patient care is better in residency programs that have effective education in the competencies. These additional measurement activities

Priority	General Competency component
Safe care	● Monitoring of care/practice analysis,
	● Use of evidence-based guidelines,
	● Coordination of care,
	● Use of technology, and
	● Communication and team work (Gaba 2000; Shapiro 2004; Sutcliffe 2004; Agency for Healthcare Research and Quality 2005; Kralewski et al. 2005).
Equitable care	● Monitoring of care; practice analysis by patients' race, ethnicity, age, etc.,
	● Use of evidence-based guidelines,
	● Knowledge of sociocultural influences on patients' health beliefs and behaviors,
	● Awareness of the impact of race, ethnicity and culture on clinical decision-making,
	● Ability to understand and communicate with patients' from diverse backgrounds, and
	● Provision of care via multi-disciplinary treatment and preventive care teams (Betancourt 2006).
Effective care	● Evidence-based decision-making (Stewart et al. 1999; Institute of Medicine 2001; Schneider et al. 2004).
Efficient care	● Performance monitoring analysis; use of benchmarks, and
	● Communication and teamwork (Overdyk et al. 1998; Friedman & Berger 2004).
Patient-centered care	● Respect patients' values, preferences and expressed needs,
	● Ensure physical comfort and provide emotional support,
	● Provide the information, communication and education that people need and want,
	● Encourage and legitimize patient's participation in care decisions; involve the patients' family and friends in their care, and
	● Coordinate and integrate care across boundaries of the system (Gerteis et al. 1993; Schneider et al. 2004; Haidet et al. 2005; Piette et al. 2005; Berrios-Rivera et al. 2006; Owlsley et al. 2006).
Coordination of care; chronic care/disease management	● Use of proper diagnostic and treatment methods,
	● Application of clinical protocols and agreed on standards of care,
	● Work within a multi-disciplinary team structure that also includes patients, families and community resources,
	● Teamwork skills; team building and leadership skills,
	● Use of technology,
	● On-going monitoring of patient status, and
	● Timely communication (Wagner et al. 1996; Sidorov et al. 2002; Corbett et al. 2005; Kralewski et al. 2005; Dorr et al. 2006; Wise et al. 2006).

Table 2. Currrent healthcare priorities and related general competency components.

present a new set of challenges. Measurement of patient care quality, in particular using clinical process and outcome measures, is still in its infancy. Assessing care quality using patient care process measures associated with desired outcomes has some advantages, but, to-date, a relatively small number of validated process measures exist. Collecting, cleaning and compiling the process data that do exist is time intensive and expensive. Furthermore, special models and measurement approaches will be needed that isolate resident contributions to care quality from those of other providers and from system effects (Swing et al. in press).

Summary and conclusions

The Outcome Project has effected medical education in the US. The General Competencies serve as a common language and a framework for thinking about and organizing graduate medical education. The competencies have expanded beliefs about what it means to be a competent physician. Many residency programs have made changes in their curriculum to better foster residents' development in the competencies and to better assess their learning and performance. Much additional educational development and implementation will be needed, however, in order to achieve widespread change and improvement. Elements of the accreditation process have changed to increase emphasis on the competencies and assessment of residents. However, increased emphasis on the use of outcome data in accreditation has not occurred yet. Further development and implementation of assessment tools and electronic data collection systems will be needed before this change can occur and before effects of competency-based education on resident performance can be evaluated.

The previously mentioned advances in assessment plus considerable expansion in validated patient care quality measures are needed to be able to link resident education and patient care quality and to study the effects of the Outcome Project on patient care.

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Notes on contributor

SUSAN SWING is Director of Research and Education at the Accreditation Council for Graduate Medical Education in the United States. Her work has focused on development and implementation of the Outcome Project. Her interests are in linking medical education and the learning environment to educational outcomes and patient care quality.

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