"COMPETENCY-BASED" CURRICULUM
(written 9/6/02)
(modified 7/16/09)
(modified 8/28/09)
(modified 10/1/09)

Over the past 10-15 years, there has been a growing movement in both UME and GME (and more recently within the field of CME as well) to place more emphasis on each learner having to acquire and then demonstrate appropriate levels of competency or mastery in core, essential, and fundamental areas of knowledge, skills, and attitudes/behaviors before progressing on to the next course, next year of medical school, or next level of medical training. In the view of the LCME (Liaison Committee on Medical Education), each medical student, as he or she graduates from medical school and sets off to pursue further training as a physician, should have achieved an appropriate level of mastery in specific areas of core, fundamental competency domains that are common to all physicians. For example, in 1994 Brown Medical School published its new competency-based curriculum. In 2000, the LCME inserted language to require each medical school to include educational goals, and measurements of competency, into its curriculum plans. In the Spring of 2002, the ACGME and the ABMS approved the concept of required core competencies in all residency and fellowship programs.

As of July 1, 2009, the LCME has further strengthened and modified specific language in its formal educational standards that all medical schools must meet in order to be accredited. With respect to requirements that each medical school must develop a cohesive, unified, planned curriculum that is truly competency-based, their most up-to-date language reads in part as follows [with a few explanatory comments from me in green type and brackets].

II. EDUCATIONAL PROGRAM FOR THE M.D. DEGREE

ED-1: The medical school faculty must define the objectives of its educational program. The objectives must serve as guides for establishing curriculum content and provide the basis for evaluating the effectiveness of the educational program.[Note that this is their very first standard in the area of education.]

> *Objectives for the educational program as a whole serve as statements of what students are expected to learn or accomplish during the course of their medical education program.*
>
> *It is expected that the objectives of the educational program will be formally adopted by the Faculty, as a whole and through its recognized governance process. [In our school, this would begin with the MEC, then progress to the Dean, to the DAB, and then to the general faculty for important curricular issues.] It is expected that the objectives of the educational program will be used by faculty members in designing their courses and clerkships and in developing plans for the evaluation of students…*
>
> *The curriculum committee [at DMS, that would be the Medical Education Committee], working in conjunction with the chief academic officer [at most medical schools, that would be the Dean, with responsibilities in this area specifically delegated to the*

appropriate dean for medical education], should review the stated objectives of individual courses and clerkships, as well as methods of pedagogy and student evaluation, to assure congruence with institutional educational objectives.

ED-1A: The objectives of the educational program must be stated in outcome-based terms that allow assessment of student progress in developing the competencies that the profession and the public expect of a physician.[Note their emphasis on measurable educational outcomes.]

> *Educational objectives state what students are expected to learn. Such objectives are statements of the items of knowledge, skills, behaviors, and attitudes that students are expected to exhibit as evidence of their achievement. The educational objectives should relate to the competencies that the profession and the public expect of a physician.*
>
> *The educational objectives established by the school, along with their associated outcome measures, should reflect whether and how well graduates are developing these competencies as a basis for the next state of their training.*
>
> *Student achievement of educational program objectives should be documented by specific and measurable outcome-based performance measures of knowledge, skills, attitudes, and values (e.g. USMLE results, performance of graduates in residency training, ...)*

ED-2: There must be a system with central oversight [at DMS, that would be the Medical Education Committee] to assure that the faculty define the types of patients and clinical conditions that students must encounter, the appropriate clinical setting for the educational experiences, and the expected level of student responsibility. The faculty must monitor student experience and modify it as necessary to ensure that the objectives of the clinical education program will be met.

> *...The system, whether managed at the individual clerkship level or centrally, must ensure that all students have the required experiences....*

ED-3: The objectives of the educational program must be made known to all medical students and to the faculty, residents, and others with direct responsibilities for medical student education.

ED-5: The medical faculty [through its required courses and clerkships, and as represented through the Medical Education Committee, a standing committee of the faculty] must design a curriculum that provides a general professional education, and that prepares students for entry into graduate medical education.

ED-7: The curriculum must include current concepts in the basic and clinical sciences, including therapy and technology, changes in the understanding of disease, and the effect of social needs and demands on care.

ED-8: There must be comparable educational experiences and equivalent methods of evaluation across all alternative instructional sites within a given discipline.

…While the types and frequency of problems or clinical conditions seen at alternate sites may vary, each course or clerkship must identify any core experiences needed to achieve its objectives, and assure that students receive sufficient exposure to such experiences….

Thus, at this time, we have our own educational reasons and accreditation requirements regarding how best to prepare our students for residencies, all pushing us towards further thoughtful improvement in how we incorporate specific educational goals into our core curriculum, and how we ascertain, measure, and document that our students are achieving appropriate levels of mastery at each step along the way.

While some schools have started from scratch and developed an entire curriculum based on achievement of a variety of core competencies (using a variety of methods of evaluation and assessment), DMS in 2003 chose to gradually phase these concepts into our current curriculum, modifying and adapting some of the ideas generated earlier by the ACGME and the ABMS for residencies. Many other medical schools adopted a similar strategy. At DMS, our plan included surveying all courses and clerkships in 2003-2005 and asking how they were addressing these six broad competency domains, and how they were assessing student levels of achievement in specific areas.

The ACGME defines these six core competencies as follows:

1. **Patient care** that is compassionate, appropriate, and effective for the treatment of health problems and the promotion of health.

2. **Medical knowledge** about established and evolving biomedical, clinical, and cognate (e.g., epidemiological and social-behavioral) sciences, and the application of this knowledge to patient care.

3. **Practice-based learning and improvement** that involves investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence, and improvements in patient care.

4. **Interpersonal and communication skills** that result in effective information exchange and teaming with patients, their families, and other health professionals.

5. **Professionalism** as manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.

6. **Systems-based practice** as manifested by actions that demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value.

When applying these competencies to UME (as compared to GME) situations, we might reorder them in terms of priority and sequencing for medical school curricula, and expand them a bit to be somewhat more UME-specific, as follows (using suggestions from the Brown curriculum, the University of Rochester Department of Medicine residency program curriculum, and other sources including the LCME outline of suggested or required content of the curriculum). Of course, we would also need to adjust them to take into account the level of the learner.

The Medical Education Committee, during the Fall of 2009, will revisit these broad competency domains, and review how they might best apply to our own curriculum leading to the MD degree. The MEC tries to always keep in mind that the ultimate goal of our curriculum is (borrowing language from the LCME) to "… design a curriculum that provides a general professional education, and that prepares students for entry into graduate medical education."

Here is our latest draft of a more detailed listing of the specific competencies which are taught and assessed at DMS. We envision the following steps that the MEC will pursue as it develops this competency-based description of our curriculum:

1. Review of this draft by all members of the MEC at several monthly meetings, looking to improve the draft, and fill in any holes or areas that need further clarity (October-November-December)

2. Solicit input from all DMS course and clerkship directors, who have specific areas of knowledge and expertise in many of these areas (October)

3. Solicit further input from DMS opinion leaders and experts, leaders who may have different perspectives on some of these important areas (October)

4. Develop a final consensus draft that is informed by input from MEC members, course and clerkship directors, and further local experts and opinion leaders (December)

5. Refer that draft for review, comment, modification, and ultimately approval by the Dean, the DAB, and ultimately a general meeting of the faculty (Jan-Feb-March)

6. Begin a new cycle of LCME-required reviews of all required courses and clerkships, in which the MEC will specifically look at which competency areas are covered, and how student progress in those areas is specifically assessed, all in preparation for the 2012 self-study and review by the LCME (March-April-May-June)

1. **Medical knowledge** about established and evolving biomedical, clinical, and cognate (e.g. epidemiological and social-behavioral) sciences, and the application of this knowledge to patient care.

    a. *ACQUIRE AND DEMONSTRATE THAT THEY CAN APPLY* useful knowledge of the updated "core basic sciences" that help to explain normal structure and function, and pathophysiology, of health and disease, such that it can be used to inform and improve patient care (e.g. anatomy/ histology/embryology, microbiology/immunology, physiology, biochemistry/metabolism/nutrition, genetics, pathology, pharmacology, pathophysiology)[see ED-11]

    b. *ACQUIRE* useful knowledge of the sciences that help students to understand where new biomedical information comes from, and how it is discovered (e.g. biostatistics, epidemiology, basic science research, clinical research, translational research, hands-on laboratory experiments, the critical analysis of data, etc.) (see ED-12, ED-17A]]

    c. *ACQUIRE AND BE ABLE TO APPLY* useful knowledge of the updated "core clinical sciences", in both inpatient and outpatient settings as appropriate, with appropriate exposure to primary care experiences, adequate to serve the needs of the generalist physician (e.g. medicine, geriatrics, surgery and its related disciplines, pediatrics, obstetrics and gynecology, psychiatry, family medicine, and neurology). [see ED-15, ED-16, ED-14, ED-13]

    d. *ACQUIRE* useful knowledge in some newer "bridge disciplines" or "themes" that is necessary to deliver excellent patient care in any specialty of medicine (e.g. clinical pharmacology, imaging, nutrition, genetics, neoplasia, medical informatics, public health, emergency medicine). [see ED 17]

    e. *ACQUIRE* useful medical knowledge in some additional topics that have become important in healthcare in general (e.g., disease prevention, risk factor modification, end-of-life care, substance abuse, medical ethics, etc.).

    f. *ACQUIRE* useful knowledge in the disciplines that describe the impact of social, economic, cultural, and personal factors upon the health of the individual, the manner in which people perceive health and illness, and the health of groups of individuals. [see ED-10, ED-21]

2. **Patient care** that is compassionate, appropriate, and effective for the treatment of medical problems and the promotion of health.

   a. *ESTABLISH* comfortable and mutually respectful student-patient relationships.

   b. *INTERVIEW* patients skillfully, utilizing comprehensive or focused history as indicated.

   c. *EXAMINE* patients skillfully and respectfully, utilizing comprehensive or focused physical exam as indicated.

   d. *DEFINE AND PRIORITIZE* patient's problems (developing an accurate and complete problem list):

   e. *GENERATE AN APPROPRIATE DIFFERENTIAL DIAGNOSIS*, with thoughtful assessment and careful, logical clinical reasoning.

   f. *FIND, READ, UNDERSTAND, AND UTILIZE* rational and evidence-based strategies for the diagnosis, managements, and monitoring of the patient.

   g. *DEMONSTRATE* appropriate level of knowledge about (e.g., indications, complications, limitations) and *UNASSISTED PERFORMANCE* of common clinical procedures (e.g. venipuncture, placing an IV catheter, lumbar puncture, etc.).

   h. *DEMONSTRATE* appropriate level of familiarity with indications, contraindications, and interpretation of complex clinical procedures (e.g., endoscopy, liver biopsy, cardioversion), possibly including assisting a more skilled physician.

   i. *DEMONSTRATE* skill in the independent interpretation of common diagnostic studies (e.g., gram stain, ECG, urinalysis, arterial blood gases, imaging procedures, etc).

3. **Interpersonal and communication skills** that result in effective information exchange and teaming with patients, their families, and other health professionals.

   a. *COMMUNICATE EFFECTIVELY WITH PATIENTS AND FAMILIES*, in order to both obtain information from the patient (as part of the history), and deliver information (explaining medical care that is indicated, counseling, etc.)

   b. *COMMUNICATE EFFECITVELY WITH PATIENTS AND FAMILIES* when special barriers to communication exist, such as the need to use an interpreter, communicating with patients who have cognitive deficits, etc.

   c. *ASSIST PATIENTS APPROPRIATELY IN MAKING INFORMED CHOICES* about their own care, especially in situations where multiple treatment options are available

   d. *COMMUNICATE EFFECTIVELY WITH PHYSICIAN COLLEAGUES* at all levels, verbally and in writing (e.g. focused or complete oral presentations, brief SOAP notes, longer admission notes, etc.)

   e. *COMMUNICATE WITH ALL MEMBERS* of the health-care team, in a manner that facilitates patient care through excellent communication and cooperation between team members from different disciplines

   f. *PRESENT IMPORTANT INFORMATION CLEARLY AND CONCISELY IN WRITTEN FORMATS,* including essay-based exams, case reports, term papers, research reports, manuscripts

   g. *TEACHES* colleagues effectively.

4. **Professionalism** as manifested through a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population.

   a. *DEMONSTRATE professional, respectful and responsible behavior* towards patients, families, colleagues, and all members of the health-care team at all times

   b. *MEET RESPONSIBILITIES FULLY,* be punctual, be present when expected, and be reliable.

   c. *DEMONSTRATE SUBORDINATION of one's self-interest*, and putting interests of the patient first.

   d. *DEMONSTRATE ADHERENCE to high ethical and moral standards*. Demonstrates honesty and integrity in all activities. [see ED-23]

   e. *DEMONSTRATE EMPATHY* with patient concerns, and be respectful of patient's concerns, points of view, and cultural traditions.

   f. *ACCEPT RESPONSIBILITY for her/his own actions*. Receives constructive criticism well. Demonstrates desire to learn and improve.

   g. *RECOGNIZE, AND APPROPRIATELY ADDRESS*, how personal issues or personal biases can interfere with one's ability to deliver quality care to every patient. [see ED-22]

   h. *DEMONSTRATE RESPECT FOR patient's confidentiality.*

   i. *DEMONSTRATE INTEREST IN his/her own education*, and takes the initiative in optimizing his/her personal education plan:

5. **Continuous personal, practice-based learning and improvement** that involves investigation and evaluation of their own patient care, appraisal and assimilation of scientific evidence, and improvements in patient care.

   a. *SEARCH EFFICIENTLY FOR AND OBTAIN* recent, high quality, relevant medical information and scientific literature about important clinical topics and questions.

   b. *READ CRITICALLY, understand, evaluate, and assess* medical information and scientific literature about important clinical topics and questions.

   c. *MEASURE ACTIVITIES in their own practice*, and learn how to improve their own delivery of care to patients.

   c. *UNDERSTAND AND BE ABLE TO APPLY core concepts of quality improvement,* and demonstrates how they apply to both medicine in general, and one's own area of clinical practice.

   d. *DEMONSTRATE THE HABIT of, and passion for, lifelong learning and improvement.*

   e. *RESPOND IN A MATURE AND RESPONSIBLE WAY to constructive criticism and suggestions for improvement*

6. **Systems-based practice** as manifested by actions that demonstrate an awareness of and responsiveness to the larger context and system of health care and the ability to effectively call on system resources to provide care that is of optimal value.

   a. *DEMONSTRATES AWARENESS OF, AND THE ABILITY TO UTILIZE*, appropriate resources in the hospital and the community to support patient care.

   b. *COLLABORATES EFFECTIVELY WITH* all members of the team providing patient care to assure optimal, comprehensive patient care.

   c. *UNDERSTANDS THE ROLES* of all members of the team providing healthcare in hospital and outpatient settings, and when various services should be arranged to optimize patient care.

   d. *CAN FIND AND APPLY* evidence-based, cost-conscious strategies in the care of patients.

   e. *UNDERSTAND AND DEMONSTRATE* how system-based operations have an impact on cost and quality of care.

   f. *UNDERSTAND HOW HEALTHCARE IS CURRENTLY FINANCED*, and how various proposals to change the healthcare system would alter the financing, delivery, and fairness of the healthcare system.

   g. *UNDERSTAND NEW INFORMATION ABOUT REGIONAL VARIATION IN THE DELIVERY OF HEALTH CARE,* and its implications for quality of care, cost of care, patient health, and evidence-based guidelines

   h. *DEMONSTRATE HOW IN DEPTH STUDIES OF THE OUTCOMES OF VARIOUS TREATMENTS* can lead to improved patient care, sometimes at lower overall cost

   i. *IDENTIFY VARIOUS METHODS OF PHYSICIAN ADVOCACY* within the healthcare system, and how they can be used to promote social justice in the delivery of health care

   j. *IDENTIFY THE ROLE OF THE PHYSICIAN* in addressing the medical consequence of common social problems that cause medical illness, such as malnutrition, lack of medical care, violence, and abuse. [see ED-20]