Competency Assessment—Redux

Five years ago *VitalSigns* published an issue titled "The Challenge of Assessing Clinical Performance." In this issue we review progress and national discussion on competency assessment.

In our earlier work on PBAs, we focused on the need for more authentic assessments, explored the competencies and assessment procedures that could be addressed, and identified promising national and CHM efforts.

Subsequently, a school-wide retreat on authentic assessments, led by Ruth Hoppe, the former Senior Associate Dean for Academic Programs, provided further impetus for development of PBAs. In this issue, we present highlights from the continuing efforts of our school to weave authentic assessments into our academic program.

The NBME has proposed a new Clinical Skills Examination as part of the medical licensure process. The Accreditation Council for Graduate Medical Education created an evaluation "tool box" to assess competencies in residency training.

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Performance Assessment–Why Should Medical Schools Care?

Ruth Hoppe, M.D., Associate Dean and Professor of Medicine

The matriculation every year of 100 or so medical students represents CHM's willingness to engage in a social contract: that of preparing its medical graduates to protect the health of the public. To be sure, this responsibility is discharged in concert with the national system of licensure, of graduate medical education and of specialty certification, ideally all working together in a coordinated way to see that the needed competencies are developed and maintained.

A commitment to develop competencies implies a commitment to measurement, and it is that activity that is capturing much attention these days, nationally and here at CHM. Curriculum has long captured our attention as educators, and assessment has been tacked on almost as an afterthought. Those days are no more: identification of competencies and of ways of measuring them, along with appropriate standard setting, will dominate the education agenda in medical schools for some time to come.

With an ever-increasing degree of precision and explicitness, we are responding to the challenge to define and then apply the tools for measuring competencies that must be in place at graduation. This challenge is taking us far beyond ascertaining whether students have retained enough of the scientific and factual knowledge, the learning of which captures so much curricular time. It is also taking us into the realm of the doctor-patient relationship, of physical examination skills, of technical and procedural skills, of the application of scientific concepts to actual clinical problems. It is also challenging us to think about how to assess the student's ability to find, interpret and efficiently use information from clinical studies, how to assess the skills needed to work in complex systems to maintain quality, hold down costs, and reduce error, how to assess the physician's ability and commitment to function in the public policy arena, and how to assess professional conduct at all stages of training.

This is clearly a tall agenda, and one that will require us to carefully think through some key questions. What do we decide to measure? Do we measure all students, or enough of a subset of students, to assure ourselves that our educational system is working, or both? What blend of "high stakes/end-of-training" assessment versus assessments that are more formative–more embedded in the curriculum–do we select? What partnerships can we make to ease the burden and cost of measurement development? What can we simulate so that our already-burdened clinical environments are not further stressed? How can technology help? Who will have this assessment expertise and how can that expertise be developed? Where will the money come from?
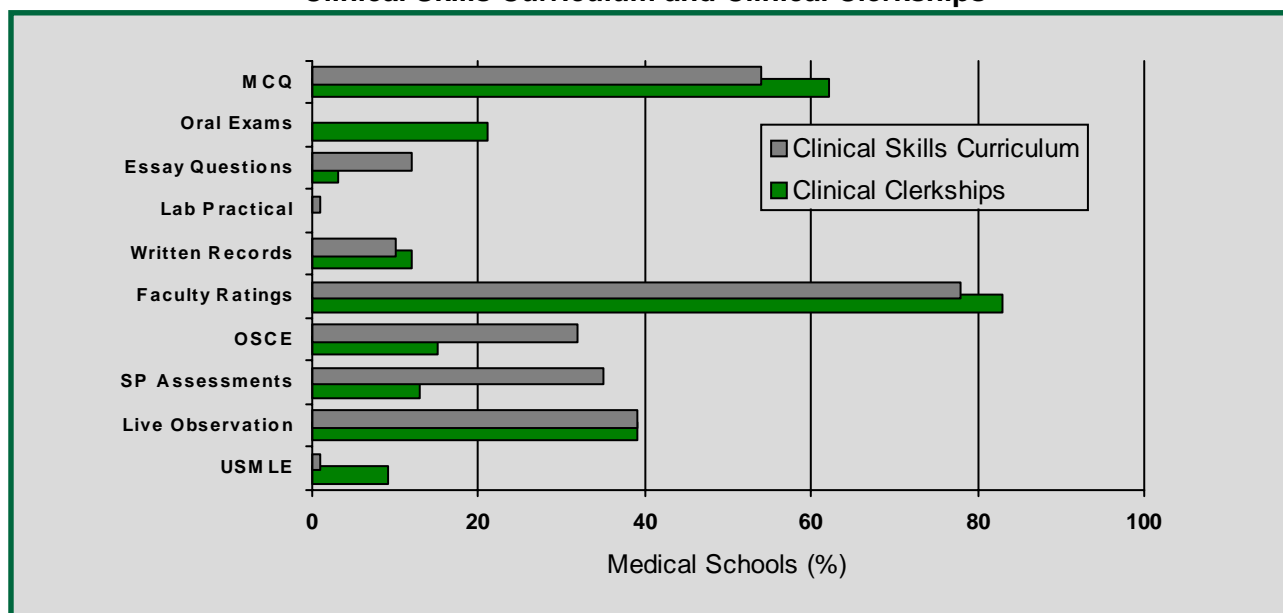
CHM Conducts Survey of Information Sources Used for Progress Decisions about Medical Students

Although many medical schools have adopted a variety of methods to assess student competency, the extent to which these innovations have changed how decisions about student progress are made is not clear. Drs. Ruth Hoppe and Brian Mavis along with then medical student Bridget Cole conducted a survey of 126 accredited allopathic US medical schools to determine which information sources were used for decisions related to medical student progress and graduation. Respondents were asked to indicate up to three information sources used for seven specific decisions about student progress. Seven types of decisions were considered relating to: grade determination (basic science, clinical skills, and clerkships); grades for clinical electives; determining honors or AOA; promotion to Year 3 and the decision to graduate.

The results indicate that multiple choice questions (MCQs) and faculty ratings remain the most frequently used information sources. The following graph reflects the sources of information and their respective importance in decision making about student progress. For grades related to clinical skills courses in the preclinical years, preceptor ratings were most frequently listed as the most important (67%) or among the three most important (78%) data sources. Among the data sources used to determine clerkship

grades, schools tended to split on whether MCQs (30%) or faculty ratings (41%) were the most important data source. Live observation was also among the most important data sources (39%) listed by respondents. Other important data sources endorsed by respondents included MCQs (54%), direct observation (39%), standardized patients (35%) and OSCEs (32%). Clinical skills education in the preclinical curriculum is the area with the broadest use of assessments for progress decisions. Decisions related to promotion to Year 3 and to graduation were determined largely on the basis of United States Medical Licensing Examination (USMLE) scores (83% and 88% respectively). Information derived from OSCEs was factored into graduation decisions by 28% of the responding schools. Several explanations are suggested for the primacy of MCQs and faculty ratings in student decisions, including familiarity for faculty and students, ease of implementation and the resources required for the adoption of other assessment strategies. Despite curricular innovations in medical education such as small group instruction and computer-based testing, there is little evidence to indicate that new assessment strategies play an important role in promotion and graduation decisions. Multiple choice questions and preceptor ratings remain the most important grade determinants for the promotion decisions examined in this study.

Top Three Information Sources for Grade Determination:
Clinical Skills Curriculum and Clinical Clerkships

A Controversial USMLE Test : The Proposed Clinical Skills Exam

The proposed addition of the Clinical Skills Examination (CSE) to the battery of United States Medical Licensing Examination (USMLE) is causing a controversy in the medical education community. The adequacy of undergraduate instruction in basic clinical skills has long been of widespread concern. The Liaison Committee on Medical Education responded by incorporating the teaching and assessment of basic clinical skills into its accreditation criteria for US schools. Further, international graduates were required to pass the Clinical Skills Assessment (CSA) before admittance into US residency programs.

The USMLE, National Board of Medical Examiners (NBME) and the Federation of State Medical Boards (FSMB) support the CSE because they believe the exam

The AMA called the CSE's implementation process "deeply flawed." Their resolution called for evidence demonstrating the validity and reliability of and necessity for the exam, additional scientific analysis published in peer-reviewed journals and more testing centers. The AMA called for suspension of the CSE's implementation until these issues are resolved.

The USMLE acknowledges that although most medical schools require students to demonstrate proficiency in clinical skills, the requirements and results are variable. They believe the $950 application fee is justifiable given the high cost of developing a reliable high-stakes exam that measures basic clinical skills on a common national standard. The USMLE also points to evidence indicating that poor

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Clinical Skills Examination (CSE) Proposed Requirements:
- New requirement for 2005 US medical school graduates for entry into residency training
- Ten-station standardized patient format
- Designed to simulate physician's workday
- Administration will take five to seven hours (including breaks and lunch)
- Estimated 1-2% (250-500 students) failure rate
- Estimated cost $950 (excludes travel and hotel accommodations)
- NBME will administer the CSE at five to seven US regional sites year-round

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will assure that candidates entering postgraduate training have the clinical skills necessary to provide supervised patient care, thereby fulfilling their role of safeguarding the public's health. But critics charge that implementation of the CSE might pose a conflict of interest, given the estimated $25 million annual revenue flow from the CSE and the joint sponsorship of the USMLE by the NBME and FSMB.

The Association of American Medical Colleges (AAMC) and the American Medical Association (AMA) oppose implementation of the CSE. The AAMC has said the exam will hurt recruitment and impose additional financial and travel hardships on medical students. Students currently average $100,000 of debt upon graduation. The organization issued a resolution suggesting funding the CSE with incremental costs from state licensing fees of already employed physicians. The resolution further urged the NBME to defer implementation of the exam until an external funding mechanism can be identified.

communication, interpersonal and general clinical skills are related to a higher incidence of malpractice suits, lower treatment compliance by patients and decreased patient satisfaction.

Supporters of the CSE believe it will reassure the public that all physicians possess minimum competency levels in clinical skills and prevent the estimated 250 to 500 applicants unable to ultimately pass the exam from entering practice. Opponents of the exam are requesting more evidence supporting the validity and reliability of and necessity for the exam. Maybe the CSE is worth the $50,000 to $100,000 per undesirable applicant price tag if it can further safeguard the public's health. Although the implementation process is moving forward, the controversy continues.

For additional information about the CSE:

United States Medical Licensing Examination
www.usmle.org/
The National Board of Medical Examiners
www.nbme.org/
American Medical Association
www.ama-assn.org/
Association of American Medical Colleges
www.aamc.org/

Showing How: Family Practice Leads Cancer Screening and Shared Decision-Making Assessments

So that students can "show how" they have learned to perform critical patient care competencies, the Family Practice Clerkship has developed two performance based assessments (PBAs). The first PBA examines third-year medical students' skills in guiding patients' cigarette smoking cessation efforts. More recently, Family Practice added a second PBA, focusing on students' abilities to use a shared decision model in working with patients. The smoking cessation and shared decision PBAs share a common focus on cancer screening tasks.

Mary Noel, Margaret Thompson and Carole Keefe described what they learned about students and their curriculum through the development, implementation and review of the performance based assessments. They stress that PBAs should be considered as a report card on how well the curriculum works, as well as providing a credible tool for assessing students. Criteria influencing the choice of the PBA tasks included the relevance that prevention counseling represents for primary care practice. In addition, the faculty noted the importance of being able to translate medical knowledge about disease screening and prevention tools to patients, making clear to patients their shared role in negotiating medical decisions about their care. Because students tend to perceive the content of evaluation procedures as a source for determining what is most important for them to learn, the use of PBAs often has the secondary benefit of communicating to students the importance that this care competency represents.

In the Family Practice Clerkship, the use of the Smoking Cessation PBA in the six community campuses has provided considerable insight into how the tobacco dependence curricula prepare students for this important care task. The Smoking Cessation PBA constitutes 10% of students' final clerkship grade. Students who fail the assessment must remediate this in order to pass this required clerkship. The students are videotaped during a 10-minute counseling session with simulated patients. Faculty rate the tapes of all simulated sessions, using a checklist based on a guideline provided by the Agency for Health Care Policy and Research. Most students do well on these key tasks, as measured by this objective assessment. The faculty acknowledge that students appreciate clear and timely feedback on their performance. Dr. Thompson is now developing a system for electronically communicating

individual responses to each of the third-year students, which includes specific comments about their performance as well as the objective rating scores.

The Shared Decision-Making PBA focuses on the students' ability to communicate with and engage patients in decisions about their care. The faculty indicate that this task is appropriate for students at this time in their training, given the prominence of patient-centered interviewing in the students' preclinical instruction.

Among the sources that the faculty have used to evaluate the "value added" of this curriculum component are periodic surveys of students. Students indicate that they see the task the PBAs assess as important for them to be able to do. They also report that they use these skills with confidence for related tasks in other clerkships, but fewer characterize themselves as being able to generalize the skills for communicating to patients about other life style changes (see graph). Faculty indicate that their involvement in the task of reviewing students' performance has provided them with important feedback about the success of and need to improve the focus of existing skills-focused curricula.

Medical Students' Evaluation of the Family Practice PBAs
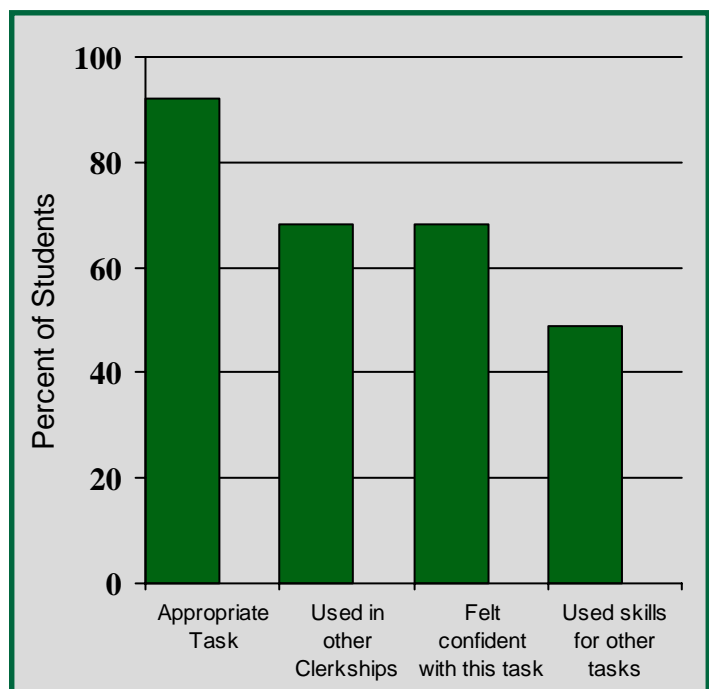
Implementing a Formative Standardized Patient Examination in the Medicine Clerkship

The Medicine Department was recently awarded a Health Resources and Services Administration (HRSA) primary care training grant to enhance the basic Internal Medicine clerkship's educational program. One of the primary objectives of the grant will be to introduce a formative standardized patient examination (SPE) as part of Education Day. Education Day is held during the second week of the clerkship in the Grand Rapids Community. It is a full-day intensive educational experience that students from all six community campuses attend. Education Day consists of several plenary and small-group educational sessions covering skills such as interpreting blood gases, inserting IVs, reading chest X-rays and conducting a cardiac examination. Since Education Day is conducted early in the clerkship, the focus of the SPE will be to provide formative feedback to the students and their community clerkship director on their strengths and weaknesses in gathering and interpreting data from a patient, as well as providing information and counseling patients.

The SPE will be conducted as one of the small group workshop sessions within Education Day and consist of two standardized patient (SP) cases. The first case will involve conducting a focused history and physical examination of a patient with a problem commonly seen in the office of a general internist such as chest pain, abdominal pain or fever and cough. Students will spend about 15 minutes conducting a focused history and physical examination of the patent while being observed by a faculty member. Students will then spend about five minutes presenting their findings to the faculty member who will probe the students' understanding of the patient's problem using a structured interview format. About five minutes at the end of the session will be reserved for the faculty member and SP to provide feedback to the student. Later, both the student and community clerkship director will receive a feedback report summarizing the student's performance based on the standardized patient checklist and faculty rating sheet. The station also will be videotaped and available for the student and preceptors to review.

The second SPE case will focus on the students' ability to provide patient teaching and discuss options for diagnostic testing or treatment. An example might be whether or not to treat a patient with stable angina medically or surgically. The student would spend the majority of the time in the station providing information and discussing the various options with the patient. As in the first station, about five minutes at the end of the station will be reserved for the SP and faculty member to provide feedback to the patient.

The second station will also be used as an evaluation of a training module given in the Family Practice clerkship on shared decision-making. The module is designed to help students develop skills in working through decisions with patients such as the one presented in this station. The rotational structure of the Block III clerkships will provide a research design for this evaluation that roughly approximates a randomized clinical trial. As can be seen in the figure, during the second rotation of the Block III clerkships, approximately half the students in the basic Medicine clerkship will have completed the Family Practice clerkship and the shared decision-making module while the other half of the students will have completed the Pediatric clerkship. During the third rotation, all the students in the basic Medicine clerkship will have completed the Family Practice clerkship, however, half will have completed it during the first rotation and half will have completed it during the second rotation. This design will provide an opportunity to assess the impact of completing the shared decision-making module on the ability of the students to use the skills they learned. Data from the third rotation will also provide information on the extent that these skills decay over time.

	First Rotation	Second Rotation	Third Rotation
Top	1. Did not complete the module	2. Did not complete the module	4. Completed the module second rotation
Bottom		3. Completed the module first rotation	5. Completed the module first rotation

We feel the SPE will provide students with specific constructive feedback on their clinical skills that is often difficult to provide in a clerkship setting. It will also provide an opportunity for faculty in different disciplines to collaborate in the evaluation of the CHM clinical educational programs.

Psychiatry Clerkship Uses Patient Interviews to Assess Students

James Springer, EdD, Christopher Colenda, MD, David Dunstone, MD, Department of Psychiatry

In an effort to provide a more balanced approach to student assessment in the MSU/CHM Psychiatry clerkships, community and Lansing-based faculty of the Department of Psychiatry initiated a formative assessment. The goal of the assessment was to measure students' performance on key elements of the doctor-patient relationship and clinical interviewing skills learned during the Psychiatry clerkship. The formative assessment of students was needed to complement existing performance measures including NBME exams, clinical ratings, and clinical case studies.

The planning process resulted in the development of a performance-based assessment (PBA) procedure that would accomplish the following key objectives:

• An observed psychiatric interview by a medical student with a "real" patient;

• Evaluation by a dept of Psychiatry faculty member;

• Assess interviewing and interpersonal skills central to the doctor-patient relationship;

• Test the capacity and effectiveness of students' presentations skills;

• Assess clinical problem-solving and decision making abilities;

• Provide a mechanism for immediate feedback regarding performance.

The PBA was based on a face-to-face encounter with a patient chosen by the community clerkship director. The assessment included a 30-minute interview followed by a case presentation where the student was questioned by the evaluator. Feedback was provided to the student immediately following the PBA. A standardized instrument was developed to measure the key skills related to: (a) communication, (b) data collection and (c) presentation and case discussion.

Following review and modification by the Department of Psychiatry Medical Student Education Committee, the process was pilot tested in Kalamazoo. Student volunteers conducted clinical examinations of volunteer psychiatric patients and made case presentations to faculty members. Interviews and case presentations were videotaped so that Medical Student Education Committee members could establish grading criteria, measure inter-rater reliability, and make procedural modifications as necessary. The revised

PBA was included as a Psychiatry clerkship requirement in September of 1999. All community faculty involved in PBA received faculty development training in the evaluation process and in use of the rating scales.

To date 275 CHM students have taken the department's PBA. Although the data are still being collected and analyzed, the preliminary findings indicate that students from each community—in spite of having differing clinical placement sites, variable lecture topics and exposure to different patient populations—did well on the assessment. Pass rates have been consistently high with no significant differences across the community campuses.

Analyses of the student performance data from the initial implementation of this PBA supported faculty members' beliefs that this assessment was measuring different and distinct elements of student performance when compared to the information provided by the USMLE scores and other objective examinations. The addition of this experience to the strategies used for student assessment in the clerkship provides a broader evaluation of student competency with a focus on integrating knowledge in "real life" patient encounters.

While it was anticipated that there might be some difficulty in finding patient volunteers, this has not been an issue. Student acceptance has been high, possibly because CHM students are familiar with observed and videotaped interviews from their preclinical years. Students have commented favorably on the opportunity for professional interaction with a faculty member with whom they had not previously worked.

Assessment of performance in Psychiatry clerkships typically includes the use of objective examiniations, preceptor ratings of clinical performance, and some type of a written paper, case study, or comprehensive patient evaluation. While these methods measure knowledge of psychopathology, generalized treatment approaches, psychopharmacology, epidemiology, and performance in clinics or on psychiatric units, they have limitations. Feedback from faculty members indicates that in addition to being able to formulate an impression of interviewing skills, psychiatric knowledge, case presentation skills, and clinical decision-making abilities, the PBA is able to provide some assessment of professional behavior as well.

Computers and Performance-Based Assessment

Kathryn Lovell, Ph.D, Block I Director

In the second year preclinical curriculum, performance-based assessment (PBA) exercises are conducted three times per year and computers have played a role in these assessments. Each PBA is designed to have students integrate information from the Clinical Skills courses and associated problem-based learning domain. Students interview and/or examine a simulated patient, complete parts of a written record, including a differential diagnosis, as well as answer questions about the pathophysiology of the process involved.

Several types of computer programs have been used during the PBA, either as part of the patient evaluation and diagnosis process, or as part of assessing pathophysiology understanding. The purpose of the computer stations has been to give students immediate feedback, provide a mechanism for identifying and correcting a student who was "heading in the wrong direction," to provide gradual unfolding of information about a patient case, and to deliver high quality images as part of the patient case or questions.

Initially, software was developed specifically for the PBAs such that questions could sequentially reveal more patient information as the case proceeded. This program was first used in a Pulmonary PBA and Neurological PBA related to pain management concepts. For the pulmonary case, students interviewed a simulated patient "presenting" with shortness of breath. After getting information about the history and symptoms from the "patient," students went to a computer station. After answering questions about the most likely diagnosis, and the diagnostic information that would be useful, the student was given results of pulmonary function tests, asked to interpret the results, and asked about conclusions related to the diagnosis and the pathophysiological process involved.

More recently Lecture Online, a course management system developed in the College of Natural Science at MSU, has been used for the computerized portion of the PBAs. Lecture Online is Web-based, which provides additional flexibility and more features than the original system described above. The quiz/homework feature of Lecture Online supports multiple question types, delivery of images and movies, and automatic scoring. The use of this program was initiated two years ago for the Neurological PBA. After taking a brief history and performing a neurological exam on a simulated patient, students went to a computer station, typed in their written record, and then logged into Lecture Online to answer questions about the location of lesion, interpretation of a radiology image, and most likely diagnosis. Advantages of this approach are that these results can be easily scored, and counted toward a part of the domain written exam, while feedback on the written record was given to students as part of Clinical Skills.

A third program, Diagnostic Reasoning (DxR) computer simulation cases, has been discussed for potential use in performance assessment of both preclinical and clinical students. The DxR case platform was developed by the DxR Group (http://www.dxrgroup.com/) at Southern Illinois University School of Medicine for use in a problem-based curriculum and for student assessment. In a DxR case simulation, students can "perform" a complete history and physical on a computer simulated patient, and order lab tests or other diagnostic procedures. During the simulation, students are prompted to enter hypotheses about the case, and at the end students list a differential diagnosis, giving justification for their conclusions. Afterwards, students get immediate feedback on their work-up. The computer system keeps track of all questions, exam items, and tests requested by a student, and faculty can get a profile of the student's approach to the case.

In summary, various types of computer programs have tremendous potential when used in conjunction with performance assessment based on standardized patients. Computer-based case simulations can also serve as a valuable tool for performance assessment of students at different stages independent of standardized patient cases. In addition, these simulations can provide students with essential practice opportunities for problem-solving in a variety of patient cases.

If CHM is to maintain and rejuvenate its self-image and national reputation for innovation in medical education, it must develop the infrastructure, people and technology to address the many challenges in these questions. In today's era, we cannot go in this direction alone – the questions are too many, the costs too high, the budgets too constrained.

Consequently, we are working together with our colleagues in Osteopathic Medicine, Nursing and Veterinary Medicine to explore the feasibility of developing an Assessment and Learning Center at MSU. We envision that such a center would contain the necessary expertise and equipment to work with and assist educators across the health professions colleges in thinking through and addressing their assessment needs. Such a center could pool limited resources, attract philanthropy, pull in many partners and collaborators, make valuable contributions to a burgeoning area of medical education research, and rejuvenate our innovative spirit. Such a center would provide significant "economies of scale" for the simulation technologies that will become routine parts of health professionals education, in ways that we are just beginning to be able to imagine. A center is also likely to help forge useful relationships with a distributed system of graduate medical education, which itself is challenged to think about assessment of competencies. There is even potential for an assessment center to become a centerpiece of continuing education activities of the health professions colleges, actualizing in the health fields the land grant mission of MSU.

The measurement of competencies will drive medical education for the foreseeable future. Curriculum change will start with the questions "what competency do we desire?" and "how is our curriculum doing?" Competency assessment will provide the denominator for the many varied curricular environments in which we place students, and thus will become the basis for program evaluation. Research in educational methodologies will focus on assessment. And finally, competency assessment of individual trainees will provide a new level of accountability for the College – to itself, to its students, and to the public it ultimately serves.

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