Proposed changes to the United States Medical Licensing Examination: impact on curricula and libraries

DOI: 10.3163/1536-5050.98.1.007

Introduction

The sequence and design of the United States Medical Licensing Examination (USMLE) is evolving in a profound way. These changes will have an impact on licensing, medical school curricular design, the way faculty present both basic science and clinical science training, and the library resources and services that students and faculty need. This article provides background on the examination process, current timetable of exams, proposed changes, and possible impact these changes will have on the curricula of medical schools and the collections and programs of academic health sciences libraries.

Anyone who has successfully completed medical school and residency and become licensed to practice medicine in the United States since the early 1990s has experienced the USMLE. Developed and maintained by the National Board of Medical Examiners (NBME), the USMLE consists of three standardized examinations called step exams. The primary function of this examination process is to aid in the granting of medical licensure in the United States. The NBME reports the results of examinations to individual medical licensing authorities (Federation of State Medical Boards [FSMB]), providing them with a common evaluation system for initial licensure of new graduates [1].

A secondary use of the USMLE is by medical schools to evaluate students’ progress through their coursework and residency. In this aspect, the USMLE has impacted the curricula of medical schools across the United States.

The NBME has proposed changing the examination format [2]. The proposed changes discussed here bring both challenges and opportunities to libraries supporting medical education programs. For example, it is possible that, at some point in the future, information-seeking skills will be evaluated as part of the overall assessment process. This speaks to the importance of evidence-based practice and has a direct relationship to the availability and quality of library resources and services, particularly instruction.

Background

According to Melnick et al., the NBME was founded in 1915 and administered the first national examinations the following year. Melnick et al. describe the first exams as “weeklong extravaganzas, incorporating essay, laboratory, oral, practical and bedside components” [3]. In 1922, the first evolution toward “step exams” took place as the exam was reorganized for basic science, clinical content, patient encounters, and oral examinations. Again, according to Melnick et al., this format was maintained until the 1950s, when another transition took place [3]. Then, the fundamental principles of psychometrics were employed, utilizing multiple-choice questions and eliminating essay questions. The examination continued to change, eliminating physical examinations, so that by the late 1980s, all questions were in multiple-choice format [3].

At the outset, the NBME examination was voluntary and functioned alongside individual state licensing examinations. The NBME and the FSMB jointly developed the USMLE sequence of examinations, which became the “single examination pathway for medical licensure” in the early 1990s [3]. After the USMLE was implemented, it came to be used by US medical schools and residency programs to ensure the academic progress of their trainees [4]. According to the USMLE web page, the pencil-and-paper examination was reformatted to a computerized version in 1999, and the USMLE Step 2 was expanded to once again include the assessment of clinical skills (USMLE Step 2 “Clinical Skills”) in 2004 [2].

The purpose of these exams is to assess “a physician’s ability to apply knowledge, concepts, and principles, and to demonstrate fundamental patient-centered skills, that are important in health and disease and that constitute the basis of safe and effective patient care” [1].

Current status and uses of United States Medical Licensing Examinations

As an important component of the curriculum, tests are extensively given to students throughout their medical school training. Their examinations include those developed by course coordinators as well as standardized tests. Typically, the first standardized examination encountered by US allopathic medical students is the USMLE Step 1. This exam is taken upon completion of the second year of training and focuses on the basic sciences, although it is presented in clinical situations or “vignettes.” Step 1 evaluates a student’s understanding of “principles and mechanisms underlying health, disease, and modes of therapy” [5]. The stakes for passing USMLE Step 1 (and subsequent steps) are very high for medical students. In most medical schools, failure on the first step stops medical students’ positive progression in the curriculum and blocks the students’ transition from the basic science curriculum to the clinical science curriculum.

USMLE Step 2 focuses on the clinical sciences. It is taken prior to graduation and is necessary for the granting of the medical degree (MD) and temporary state licensure during the first year of residency training. This component of the USMLE step process has two “sub”-examinations: “Clinical
Knowledge” and “Clinical Skills.” This examination is typically taken after students have completed their third year of medical school, when they encounter the “core clerkships,” gaining clinical knowledge and skills. Step 2 “Clinical Knowledge” is used to determine if students “can apply medical knowledge, skills, and understanding of clinical science essential for the provision of patient care under supervision and includes emphasis on health promotion and disease prevention” [6]. The “Clinical Skills” portion uses standardized patients to simulate “common and important situations that a physician is likely to encounter in clinics, doctors’ offices, emergency departments, and hospital settings” [6] and ensures that students have the communication and problem-solving skills to work in the fast-paced clinical environment. Passing of the Step 2 examination allows for patient care under supervision, indicating that the graduate is ready for residency. Should students fail to pass either Step 2 “Clinical Knowledge” or “Clinical Skills,” forward progression in training is brought to a halt. Until students pass the USMLE Step 2 exams, they will not gain temporary licensure and cannot begin training in the postgraduate or residency curriculum.

Step 3 is usually taken after the first year of residency and, in many states, awards the resident permanent medical licensure. It assesses whether resident physicians “can apply medical knowledge and understanding of biomedical and clinical science essential for the unsupervised practice of medicine, with emphasis on patient management in ambulatory settings” [7]. Although most residents sit for this examination at the end of the postgraduate year one, the timing of this examination varies, as state licensing requirements [8], residency program policies, and hospital policies may dictate specific timeframes. This issue may even be discussed in resident contracts that are signed annually in residency programs. Should residents fail this examination, specific residency program and hospital policies would come into play. Some residency programs dismiss residents who fail to pass on the first sitting, while others allow a second attempt at passing USMLE Step 3.

Although medical schools may be considered “secondary” users of the USMLE examination sequence [9], the USMLE step examinations have become a major evaluative tool for medical school curricula and are considered during the accreditation process for medical schools, which is conducted by the Liaison Committee on Medical Education (LCME). The LCME is sponsored by the Association of American Medical Colleges (AAMC) and the American Medical Association (AMA). Medical schools analyze their students’ performance on the step exams as an indicator of the effectiveness of their curricula by discipline, as indicated in the results. Other “secondary” users of these performance data include residency program selection committees [9, 10], who often consider USMLE Step 1, and in some cases Step 2, results as a criteria for candidate selection. Thus, the impact of student performance in this sequence of exams is felt by both the medical training institutions and the individual medical students as they progress through the training programs.

Proposed changes

Review of the USMLE was initially discussed by the Composite Committee of the NBME in 2006. It was determined that the NBME, FSMB, and Educational Commission for Foreign Medical Graduates were to develop a process to review the exam sequence, thus the Comprehensive Review of USMLE (CRU) was named along with the Committee to Evaluate the USMLE Program (CEUP).

As a part of this review, surveys were conducted and several focus groups were called together at national meetings—such as the annual meetings of the AAMC, Group on Educational Affairs, and Group on Student Affairs—to discuss the uses of the examinations. Included were many different USMLE constituents ranging from licensing agencies to medical school faculty members. CEUP has finished its review and submitted a report to the USMLE governance. Three of the recommendations have been endorsed by the NBME Composite Committee and were reported in the fall/winter issue of the NBME Examiner as follows:

1. Assessments be developed to determine a physician’s readiness to provide patient care at two points: between undergraduate and graduate medical education, and at the beginning of independent (unsupervised) practice.

2. Adopt a general competencies schema for the overall design, development, and scoring of USMLE, using a model consistent with national standards.

3. Emphasize the importance of the scientific foundations of medicine in all components of the assessment process. The assessment of these foundations should occur within a clinical context or framework to the greatest extent possible [11].

The first recommendation relates to the timing of assessments: after graduation from medical school (when the current USMLE Step 2 takes place) and at the beginning of unsupervised practice (when USMLE Step 3 usually takes place, at the end of the first year of residency). This implies the eventual elimination of the current USMLE Step 1, which occurs at the end of the medical student’s second year. The third recommendation refers to the inclusion of basic sciences throughout all assessment steps. There is some evidence that students’ knowledge of basic sciences diminishes between administration of the current USMLE Steps 1 and 2 and may be based on the segregation between basic sciences and clinical sciences in the curriculum [9]. This change would encourage the application of basic sciences throughout the curriculum and promote the long-term retention of this knowledge.
Curricular implications

As discussed above, it appears that the current USMLE sequence of examinations will change, although these changes may be gradual, evolving over time [9]. The recommendations indicate a melding of the basic science components with the clinical science components, endorsing the importance of a solid scientific foundation on which clinical practice can be built. Although it is not clear how this would be accomplished, it is felt by many that this change would have a profound effect on curricula and promotion policies [12–15]. Just from the standpoint of promotions, the AAMC reports that the vast majority of medical schools in this country use the USMLE Step 1 as a “gateway” between the basic science and clinical curricula [16]. Further, an annual questionnaire that each medical school must submit to the LCME specifically asks for an accounting of student performance on USMLE Steps 1 and 2 [17].

Combining USMLE Steps 1 and 2 is a daunting consideration for faculties and schools where a traditional medical curriculum exists. In the traditional curriculum, basic sciences are taught during the initial years of the curriculum, and their placement is not as flexible as more problem-based or systems-based curricula. The opportunity of infusing basic sciences into the clinical years is the challenge. This would likely be more readily accomplished in problem-based curricula due to their flexibility, resources, organization, and faculty training. For those programs that have recently expanded to geographically separate campuses for clinical training, infusion of basic sciences into a clinical curriculum could become very difficult. On the other hand, in recent years some schools have made efforts to include and expand patient-centered experiences during the medical student’s first year. Combining Steps 1 and 2 would spur this type of activity further so that basic sciences would be more clearly embedded into the clinical years and vice versa. As the basic science and clinical curricula are blended together to meet the needs of the new USMLE exam model, it is quite possible that basic scientists will be asked to provide information in the clinical curriculum. It will also be important for clinical faculty to “revisit” basic science materials in their course lectures.

Library implications: challenges and opportunities

One of the most exciting prospects for libraries is the possible future inclusion of assessments of students’ ability to locate and evaluate medical information. The NBME Examiner reports that CEUP recommends research be conducted to “develop assessments focusing on the doctor’s ability to access relevant information, evaluate its quality, and apply it to solving clinical problems” [11]. In a recent article summarizing the changes, Andersen, a member of the NBME Task Force, states, “if it proves possible, test formats that require the appropriate use of online database searches to make clinical judgments will be included in the examination” [9]. This parallels the 1998 AAMC Medical School Objectives Project and its report on medical informatics and population health, which states that medical schools must ensure that graduates have “the ability to retrieve (from electronic databases and other resources), manage, and utilize biomedical information for solving problems and making decisions that are relevant to the care of individuals and populations” [18].

These acknowledgements that the ability to access information is critical for physicians support the vital role that library instruction should play in the medical school curriculum. The fact that this skill might be formally evaluated in the future is of utmost importance to libraries that support medical schools and will impact how they plan their instructional programs. These changes may provide support for libraries to integrate their instructional programs into the medical curriculum if they have not previously done so. If a library has a curriculum-integrated program, this may promote its growth.

The blending of basic and clinical sciences will also impact library instruction programs that continually change to meet the needs of the students in each year of a curriculum. For example, library instruction in the first year of medical school may focus on basic sciences, while instruction provided in the third to fourth years is likely to include clinical resources, evidence-based medicine, and so on. If the curriculum changes, library instructional programs will need to incorporate basic sciences examples and resources appropriate for use across the four years of undergraduate medical instruction.

Any changes in the curriculum and testing would naturally lead to changes in the materials used to support the coursework. As libraries support curricula with both collections and services, they are bound to be affected by this change. Below are other possible areas of library impact.

- Online Resources: If the USMLE Step 1 (basic sciences) and Step 2 (clinical sciences) are combined into one exam, libraries providing access to online resources in the basic sciences may have to make licensing adjustments. For example, a library may currently provide access to a key online anatomy resource, licensed for a limited number of simultaneous users. In the current curriculum design, this resource is probably primarily used by first-year medical students. If medical school curricula are redesigned to incorporate basic sciences into all four years, then it is likely that students in the second to fourth years will also access this resource. This has the potential for turn-away errors as the number of simultaneous users is exceeded. Librarians will need to plan for this in their budgets. In the first few years of the change, librarians will need to closely monitor
this situation and react rapidly to necessary licensing adjustments.

Exam Review Resources: Librarians may also want to increase investment in online exam review resources as they are developed and revised to mirror exam changes. As the print exam review resources are revised, this is another area of investment for library collections. If the entirety of the USMLE Step 1 and Step 2 exams change, previous collections will become obsolete rather quickly, and a large initial investment may be necessary to provide students with adequate support. Students often seek advice on test preparation tactics from upper-level students or recent graduates. As changes to the USMLE step exams occur, students will not have that avenue of support. Therefore, it will be imperative to have new support materials in place prior to changes.

As the examination process and curricula change, this will be a time of great stress for students and faculty. This could be an opportunity for medical libraries to strengthen their relationships with faculty by providing appropriate resources in medical education, curriculum design, case examples for class lectures, and other needed support. The key will be planning ahead for the change.

Summary

The NBME has announced that they do not anticipate that these changes will impact test takers for at least four years [11]. It has also been reported that the changes may be gradual with the current tests showing changes in questions and content over time [9]. Planning and implementing curricular changes to support a change in the USMLE structure will take a great deal of time and effort. These changes impact not only the curricula, but also key systems, such as libraries, which provide licensed online and print resources for exam review as well as curricular support through their resources and services. Changes to the USMLE are inevitable—if not imminent. Librarians must stay abreast of developments that will affect their constituents as well as their delivery of resources and services. Beyond that, they can imagine new opportunities that can arise from this latest shift in the examination process.

Susan Kies, EdD, kies@illinois.edu, Associate Dean of Academic Affairs, College of Medicine, University of Illinois at Urbana-Champaign, 190 Medical Sciences Building; Mary Shultz, MS, AHIP, shultz@uic.edu, Health Sciences Librarian and Associate Professor, Library of the Health Sciences-Urbana, University of Illinois at Chicago, 102 Medical Sciences Building; 506 South Mathews Avenue, Urbana, IL 61801

Received July 2009; accepted August 2009

References
1. Federation of State Medical Boards and National Board of Medical Examiners. United States Medical Licensing Examination®: about USMLE [Internet]. Philadelphia, PA: USMLE Secretariat; 2009 [cited 1 Apr 2009]. <http://www.usmle.org/General_information/general_information_about.html>.
2. Federation of State Medical Boards and National Board of Medical Examiners. United States Medical Licensing Examination®: comprehensive review of USMLE: USMLE moves to next step in design review [Internet]. Philadelphia, PA: USMLE Secretariat; 2009 [10 Jun 2008; cited 4 May 2009]. <http://www.usmle.org/General_information/review.html>.
3. Melnick DE, Dillon GF, Swan son DB. Medical licensing examinations in the United States. J Dent Educ. 2002 May; 66(5):595-9; discussion 610-1.
4. Federation of State Medical Boards and National Board of Medical Examiners. United States Medical Licensing Examination®: comprehensive review of USMLE [Internet]. Philadelphia, PA: USMLE Secretariat; 2009 [15 Aug 2007; cited 4 May 2009]. <http://www.usmle.org/General_Information/CRU/review-2007-08-15.html>.
5. Federation of State Medical Boards and National Board of Medical Examiners. United States Medical Licensing Examination®: Step 1 [Internet].Philadelphia, PA: USMLE Secretariat; 2009 [cited 6 May 2009]. <http://www.usmle.org/Examinations/step1/step1.html>.
6. Federation of State Medical Boards and National Board of Medical Examiners. United States Medical Licensing Examination®: Step 2 [Internet]. Philadelphia, PA: USMLE Secretariat; 2009 [cited 6 May 2009]. <http://www.usmle.org/Examinations/step2/step2.html>.
7. Federation of State Medical Boards and National Board of Medical Examiners. United States Medical Licensing Examination®: Step 3 [Internet]. Philadelphia, PA: USMLE Secretariat; 2009 [cited 6 May 2009]. <http://www.usmle.org/Examinations/step3/step3.html>.
8. Federation of State Medical Boards (FSMB). FSMB: state-specific requirements for initial medical licensure [Internet]. Dallas, TX: The Federation [cited 6 May 2009]. <http://www.fsmb.org/usmle_elinitial.html>.
9. Andersen OS. Changing the USMLE: challenges and opportunities for physiology and other medical school basic science departments. The Physiologist. 2009 Apr;52(2):39-44.
10. Cooper S. USMLE reform: a primer. The Physician Scholar [Internet]. 2008 Feb/Mar;1(2). [cited 4 Sep 2009]. <http://www.physicianscholar.org/id/117086>.
11. National Board of Medical Examiners. USMLE moves to next step in design review. Examiner. 2008 Fall/Winter;55(2):1-4.
12. Gores G, Virling J, McCullough A. (American Association for the Study of Liver Diseases). Letter to: Daniel E. Melnick, Peter V. Scoles, and Gerard F. Dillon (National Board of Medical Examiners). 3 Dec 2007 [Internet]. <http://deansnewsletter.stanford.edu/archive/02_25_08.html>.
13. Wilkerson L, Wimmers P, Doyle LH, Uijtdehaage S. Two perspectives on the effects of a curriculum change: student experience and the United States Medical Licensing Examination, Step 1. Acad Med. 2007 Oct;82(10 suppl):S17-20.
14. Dean’s Office. Concerns about proposed changes to USMLE. The Dean’s Newsletter [Internet]. Stanford, CA: Stanford University School of Medicine [25 Feb 2008; cited 4 Sep 2009]. <http://deansnewsletter.stanford.edu/archive/02_25_08.html>.
15. Baptista NV. Alliance groups respond to proposed changes to USMLE. Acad Intern Med Insight [Internet]. 2008,6(2):10. 16. [cited 4 Sep 2009].
16. Association of American Medical Colleges. CurrMIT: curriculum management & information tool [Internet]. Washington, DC: The Association; 2007 [cited 10 Apr 2007]. <http://www.aamc.org/meded/curric/start.htm>.

17. Liaison Committee on Medical Education (LCME). Annual LCME medical school questionnaires [Internet]. The Committee [cited 4 Sep 2009]. <http://www.lcme.org/qanaires.htm>.

18. Association of American Medical Colleges. Report I. learning objectives for medical student education: guidelines for medical schools. Washington, DC: The Association; 1998.