Beyond Technical Standards: A Competency-Based Framework for Access and Inclusion in Medical Education
Raymond H. Curry, MD, Lisa M. Meeks, PhD, and Lisa I. Iezzoni, MD, MSc

Abstract
Efforts to include people with disability as students and practitioners in the health professions have gained momentum in recent years. However, prevailing technical standards at U.S. medical schools have biases that can prevent or impede their admission, promotion, and graduation. These standards derive from an approach first promulgated in 1979 and have since remained largely unaltered. Current technical standards at most medical schools are now at odds with changes occurring since the 1990 enactment of broad civil rights protections for people with disability and current aspirations for diversity, equity, and inclusion in the medical profession. It is time to replace the technical standards construct with an approach more consistent with current medical practices, and with societal imperatives of equity and social justice. Such an approach should assess candidates’ demonstrable skills and merits, rather than relying on a preconceived construct identifying the presence or absence of defined levels of ability. The maturation of competency-based approaches to curricular design and assessment provides an opportunity to reconceptualize the abilities required to practice medicine, foster the appropriate inclusion of physicians with disability, and better align medical education and training with broader societal needs and goals.

I would like to see the day when somebody would be appointed surgeon somewhere who had no hands, for the operative part is the least part of the work. Harvey Cushing, in a letter to Henry Christian, November 1911

Dr. Cushing surely did not anticipate the context in which his words now appear. His subject—expressed with clearly intentional hyperbole—was whether the new Peter Bent Brigham Hospital’s bylaws should impose a mandatory retirement age. Yet the applicability to our present subject is undeniable. Cushing prioritized the cognitive skills and experience of a surgeon over their manual abilities, recognizing a reality that has become increasingly evident in recent decades. Today’s physician must understand and have access to a vast scope of information but need not utilize or even possess the full range of physical and/or sensory abilities. Indeed, many physicians with disability—including many who acquired their disability post medical education and training—are safely serving in our health care workforce.

The Association of American Medical Colleges (AAMC) has published several guidance documents5–4 to assist programs with increasing the inclusion of learners with disability. The most recent of these5 summarizes the current state of medical education for otherwise qualified learners with disability. That report describes multiple ways in which institutions can and have fostered inclusion. Many barriers remain, however, beginning with a lack of clear policies and procedures, biased assumptions and attitudes about disability, and career counseling that fails to explore the full range of practice options for graduates with disability. In addition, the technical standards remain a critical roadblock for applicants with disability seeking medical education.

This paper examines the history of technical standards and how, despite their origin in response to laws enacting disability civil rights protections, they have become a barrier to inclusion. We focus on physical and sensory disabilities, as do most current technical standards formulations. We propose a reconceptualization of the selection and assessment of prospective physicians based upon current concepts of physician competence and “competency-based education.” This approach may eliminate the need for technical standards altogether, but nonetheless ensures that graduates are fully competent to provide high-quality medical care.

History of Technical Standards and Disability Civil Rights
Section 504 of the Rehabilitation Act of 19736 was the first federal law to prohibit discrimination against people with disability by programs that receive federal funding, including medical schools. The term “technical standards” first appeared in regulations following enactment of Section 504, in the context of defining an “otherwise qualified handicapped individual” as someone “who meets the academic and technical standards requisite to admission or participation in the [school’s] education program or activity.”7 In 1979, an AAMC Special Advisory Panel on Technical Standards proposed a 5-part categorization of the technical standards that medical schools should require for admission: intellectual–conceptual abilities, behavioral and social attributes, communication, observation, and motor capabilities.8 Educational programs for other health professionals adopted the same general formulation, which remains the norm today.9,10 In 1990, the Americans with Disabilities Act (ADA)11 extended the civil rights protections of Section 504...
beyond programs receiving federal funds, introducing the concept of reasonable accommodations to ensure equitable access to educational opportunities for people with disability. However, little changed in the format or content of the technical standards promulgated by health professions schools. A study conducted in 2015, 25 years after the ADA’s passage, found that the information provided about technical standards by over half of degree-granting medical schools (MD and DO degrees) did not describe policies or practices for the provision of reasonable accommodations for students with disability.12

The “undifferentiated graduate”

Another barrier to access—very much intertwined with the technical standards construct—is the assumption that every medical school graduate should be capable of entering any specialty. This premise dates to 1950, when a panel of distinguished surgeons wrote that every medical school graduate should be capable of entering any specialty. This statement imagines every student being “totipotential” (i.e., capable of “differentiating” in any direction, to employ a biological metaphor). The AAMC’s 1984 Report of the Project Panel on the General Professional Education of the Physician (GPEP)14—perhaps the most influential document in late 20th-century medical education—has perpetuated this assumption, though usually expressed in terms of the “undifferentiated” graduate (i.e., not yet differentiated in whatever directions might be feasible). The emphasis within the GPEP report, however, highlights the breadth required of the curriculum, in an attempt to discourage a narrow focus by those students already convinced of their specialty choice, not the expectation that each individual student should be qualified for any specialty.

Still, many medical educators continue to expect that every prospective medical student should be “totipotential.” Technical standards sustain this expectation when they demand a full range of motor, sensory, and other abilities.

Disconnects between policy and practice

In the current educational and practice environment, policy and practice are disconnected: the technical standards have become anachronistic. Students first encounter the technical standards during the admissions process. They are usually asked to attest to their ability to meet them, with or without accommodation—often before they have had the opportunity to fully consult with the institution’s disability service professionals regarding the provision of reasonable accommodations, and often with little understanding of the competencies they will need to demonstrate in clinical settings.

Consider a student whose physical disability does not allow them to perform a required procedural skill, such as chest compressions for cardiopulmonary resuscitation. An accommodation strategy that allows them to use their knowledge of relevant principles and practice to direct others to perform the procedure would be one solution—but one likely precluded by most technical standards policies, if applied literally. The alternatives are either to consider the student to have failed the activity (and perhaps to be unsuited for the profession entirely) or to gloss over the omission of this procedural skill among the school’s required learning objectives. The latter amounts to a tacit acknowledgment that an understanding of the clinical condition and procedural knowledge are the essential learning outcomes and that a technical standard that demands motor skills is not truly essential. In addition, this lack of clarity about the essential learning outcomes is likely to lead to inconsistent performance expectations among students with disability—inviting biases related to the student’s disability category, personality, or to other extraneous factors.

This disconnect between the literal intent of technical standards and their often ambiguous and uneven application among students contributes to the problem of achieving inclusiveness in medical school admissions. Only those brave enough to face the uncertainties about how their disability will be received venture to apply to medical school; others are likely deterred by the continued insistence, through the technical standards, that students be capable of performing maneuvers not required of many physicians past the point of training. In this way, the technical standards have limited access to the profession by necessitating the acknowledgment that an understanding of clinical condition and procedural knowledge are the essential learning outcomes and that a technical standard demands motor skills is not truly essential. In addition, this lack of clarity about the essential learning outcomes is likely to lead to inconsistent performance expectations among students with disability—inviting biases related to the student’s disability category, personality, or to other extraneous factors.

A Competency-Based Framework for Access and Inclusion Across the Continuum

Two decades ago, Reichgott proposed a reframing of the 5 AAMC advisory panel domains according to “what” a student must do rather than “how” the student should be equipped to do it.16 Kezar et al have recently revisited this approach,16 applying Reichgott’s concept to the competency-based medical education (CBME) framework now dominating current approaches to curricular objectives and outcomes in medical education and also suggesting the incorporation of entrustable professional activities (EPAs), a practical approach to assessment of specific competency-related tasks in real-world settings.17

Amid increasing interest in and attention to disability inclusion, CBME strategies may best untangle this Gordian Knot, reconceptualizing the technical standards.

Thinking in CBME terms brings a “functional” approach to technical standards. It considers students’ potential to achieve within an environment that recognizes individual differences as a normal aspect of being human and offers appropriate accommodations as a matter of course. This contrasts with the prevailing “organic” approach, which focuses on the limitations or deficits associated with a student’s disability.18

Eliminating technical standards

In applying the functional approach, Kezar et al recommend that educators “correlate or integrate the expectations of their [technical standards] with the core competencies and/or EPAs expected of all students.”16 We wish to go further and suggest that the advent of competency-based educational principles and EPAs eliminates the need for a separate set of restrictive and potentially discriminatory technical standards in medical education. To illustrate our arguments, we present 3 existing formulations of expectations for students’ ability to perform the physical examination and related skills.

The organic model. One formulation of technical standards used by a number
of schools includes this example of the organic model: Candidates “should have sufficient exteroceptive sense (touch, pain, and temperature); proprioceptive sense (position, pressure, movement, stereognosis, and vibratory); and motor function to carry out the requirements of the physical examination.”18

The functional approach. Kezar et al offer the following as a consideration of the functional approach: “Candidates must perform routine physical examination and diagnostic maneuvers. Candidates must be able to provide or direct general care and emergency treatment for patients and respond to emergency situations in a timely manner.”16

Competency-based approach. In contrast, the following 2 examples are variations on a competency-based approach to clinical skills performance expectations. The first example relies upon the most commonly elaborated framework for overarching program objectives in medical school curricula—the Physician Competency Reference Set—which requires that students be able to: “Gather essential and accurate information about patients and their conditions through history-taking; physical examination; and the use of laboratory data, imaging, and other tests.”20 Similarly, the second example—AAMC’s Entrustable Professional Activities for Entering Residency—requires that students: “Perform a clinically relevant, appropriately thorough physical exam pertinent to the setting and purpose of the patient visit.”17

These comprehensive CBME educational frameworks can achieve the intended purposes of technical standards without any need to specify additional parameters that define the “otherwise qualified handicapped individual.” The specifics of an educational program’s competency expectations and/or EPAs could provide more explicit anticipatory guidance for prospective students and residents as to their initial qualifications, as well as for the determination of accommodation needs, than is possible with the use of most current technical standards formulations. This method also incorporates into medical education the principle of universal design, a strategy that acknowledges and normalizes the variability of all students’ learning approaches and the need for pedagogical flexibility.20 Technical standards, by contrast, separate the student population into those with disability and those without, identifying and often stigmatizing the former as categorically different. Within a competency-based framework, there can be a spectrum of needs for accommodation that is more specific and nuanced, and less stigmatizing.

Essential abilities for entry into residency

Although we believe that medical school graduates need not be “totipotential,” every student does eventually differentiate, most notably at the transition to residency. Career pathways in medicine encompass a broad range of essential abilities—the term analogous to technical standards that usually applies in employment-related settings—that differ from one specialty to another. The essential abilities required of an emergency physician, a pediatrician, and a psychiatrist are quite different.

From this perspective, more refined efforts to assess specific technical abilities—or, in this arena, essential functions—should accompany the residency selection process. This offers another opportunity to apply competency-based approaches and provide more useful guidance for facilitating the inclusion of trainees with disability. The Common Program Requirements of the Accreditation Council for Graduate Medical Education (ACGME) currently state that “residents must be able to competently perform all medical, diagnostic, and surgical procedures considered essential for the area of practice,” with individual specialty review committees further empowered to determine “specific content … with input from the appropriate professional societies, certifying boards, and the community.”21 The review committees rarely elaborate these essential abilities in any detail; the general surgery requirements, for example, simply state that “residents must demonstrate competence in manual dexterity appropriate for their level.”22

Each specialty now does, however, have well-defined competency-based outcomes, as well as milestones for tracking trainees’ progress. A prospective surgery applicant, for example, might be able to anticipate their ability to succeed in residency from the ACGME Milestones Guide for the discipline23 or from listings of the procedures required for board certification.24 A more formal linkage of these specialty-specific definitions of competency to the required essential abilities, in parallel to what we propose at the medical school level, would facilitate career counseling and disability accommodation strategies across the medical education continuum. If applied effectively at the point of transition to residency, the perceived need for medical schools to ensure that their graduates can “enter without handicap any one of the fields of medical practice”25 would dissipate.

Honoring medicine’s social contract

The health professions have long been considered to have a social contract with the public.26 The professions are granted a degree of self-regulation and in some instances public support (e.g., Medicare funding for graduate medical education) and in return are obligated to behave altruistically and to address societal health care needs. One such obligation that often enters into discussions of health professionals with disability is the potential of risks to patient safety.26 While hypothetical scenarios exist in which an individual clinician’s disability places patients at risk, the realities of quality care and patient safety are increasingly rooted in health care delivery systems, effective teamwork, and sensitivity to patients’ needs.27 We have yet to find case law documenting harm to patients directly related to a clinician’s functional limitations, whether physical, sensory, or learning disabilities, or psychological or other chronic health conditions. (We view cases of physician impairment resulting from substance abuse or major psychiatric illness as a separate issue.)

The health professions’ social contract is also honored when practitioners themselves represent the diversity and lived experience of the public they serve. Consider the career of Paul B. Magnuson, MD (1884–1968). His mentor in orthopedic surgery at the University of Pennsylvania, DeForest
Willard (1846–1910), had had polio and operated from:
A stool made in the shape of a saddle on four legs resting on a platform with casters. The nurses would push that stool under him ... ascribe that saddle he would operate for hours.24

We can easily conjecture that Willard’s disability motivated his pioneering orthopedic career. We also can imagine the impact on his student Magnuson, who later served as medical director for the Department of Veterans Affairs (VA) during World War II. Magnuson greatly expanded the federal government’s focus on the care of disabled veterans through the creation of our nationwide system of VA affiliations with academic medical centers and also founded the Rehabilitation Institute of Chicago.

Conclusion
The welcome inclusion of people with disability enhances the diversity of the medical profession and promotes equity and social justice. The technical standards first elaborated nearly 4 decades ago have changed very little, despite dramatic changes within and beyond medicine. It is time we create more meaningful expectations that are better aligned with contemporary educational practices and with the profession’s societal contract. The distinction between the competencies necessary for granting of the MD degree and those for medical practice in each discipline should be made explicit and addressed at the appropriate point(s) in medical training. Through these concrete and relatively simple steps, we can better align health professions education and training with societal needs and goals.

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R.H. Curry is professor of medicine and medical education, University of Illinois at Chicago, and senior associate dean, educational affairs, University of Illinois College of Medicine, Chicago, Illinois; ORCID: http://orcid.org/0000-0003-3381-0125.

L.M. Meeks is assistant professor of family medicine, University of Michigan Medical School, Ann Arbor, Michigan, and researcher, Center for a Diverse Healthcare Workforce, University of California, Davis, School of Medicine, Sacramento, California; ORCID: http://orcid.org/0000-0002-3647-3657.

L.I. Iezzoni is professor of medicine, Harvard Medical School, and Health Policy Research Center, Mongan Institute, Massachusetts General Hospital, Boston, Massachusetts; ORCID: http://orcid.org/0000-0002-1416-5039.

References
7 Section 504 Federal Guidance, 45 C.F.R. 84.3 (1973).
11 42 U.S.C. §12101 et seq.
13 Report to the American Surgical Association of the Committee on Undergraduate Medical Education. Trans Meet Am Surg Assoc Am Surg Assoc. 1956;68:523–554.