Technical Standards from Newly Established Medical Schools: A Review of Disability Inclusive Practices

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ABSTRACT

INTRODUCTION: Technical standards document US medical school’s nonacademic criteria necessary for admission, persistence, and graduation through their technical standards. These standards are a requirement for accreditation by the Liaison Committee for Medical Education (LCME)³ and the Commission on Osteopathic College Accreditation (COCA).² Outside of a general requirement to maintain technical standards, neither accrediting body requires specific language nor provides additional guidance on the development of these standards, with most schools utilizing outdated guidance from a 1979 report.³

The 1979 report recommends that US medical schools outline expectations for students in six predominant domains: Observation, Communication, Motor, Conceptual, Integrative and Quantitative, and Behavioral and Social. Technical standards barriers are usually noted in the Communication and Motor domains. For example, while the ability to hear is not critical to the provision of medical care, the 1979 standard recommended language states that, “A candidate should be able to speak, to hear, and to observe patients in order to elicit information, describe changes in mood, activity, and posture, and perceive nonverbal communications.”³ For all physicians, the ability to communicate efficiently and effectively is central to the physician–patient interaction, however, this can be facilitated through the use of sign language interpreters and assistive technology. Given this, including the term hear is not in keeping with the legal obligation that precludes institutions from applying, “eligibility criteria that screens out or tends to screen out an individual with a disability or any class of individuals with disabilities.”³ as this statement would explicitly screen out those who are deaf, even though these individuals could use assistive devices and interpreters to complete the standards.⁵

The promulgation of this guidance results in technical standards that do not fully consider current technological advances and emerging practices in the area of disability inclusion.⁶ As a
result, technical standards remain one of the largest barriers for students with disabilities who wish to enter medical school.6

Newer guidance on developing inclusive standards has been available to schools for over a decade (Table 1).6 However, a 2016 study suggest that less than half (33%) of medical schools maintain technical standards that clearly communicate the school’s willingness to accommodate learners with disabilities.7 In that same study, 4% of schools included language that explicitly banned accommodations necessary for students with physical and sensory disabilities including intermediaries or assistive technology, a practice not in keeping with the legal requirement to evaluate accommodations on a case-by-case basis.5

A commentary reflecting on the aforementioned study argued that technical standards should employ “functional” rather than “organic” language.8 Organic technical standards

| ARTICLES                                                                 | AUTHORS                        | YEAR PUBLISHED |
|--------------------------------------------------------------------------|--------------------------------|----------------|
| Beyond Technical Standards: A Competency-Based Framework for Access and Inclusion in Medical Education | Curry, Meeks, and Iezzoni      | 2020           |
| Leading Practices and Future Directions for Technical Standards in Medical Education | Kezar et al                    | 2019           |
| The Americans With Disabilities Act, Reasonable Accommodations, and Medical Education | Pavlik et al                   | 2019           |
| Removing Barriers and Facilitating Access: Increasing the Number of Physicians With Disabilities | Meeks, Herzer, and Jain        | 2018           |
| U.S. Medical Schools’ Compliance With the Americans With Disabilities Act: Findings From a National Study | Zazove et al                   | 2016           |
| Medical schools’ willingness to accommodate medical students with sensory and physical disabilities: Ethical foundations of a functional challenge to “organic” technical standards | McKee et al                    | 2016           |
| Technical Standards and Lawsuits Involving Accommodations for Health Professions Students | Samuel R. Bagenstos, JD        | 2016           |
| Technical Standards and Deaf and Hard of Hearing Medical School Applicants and Students: Interrogating Sensory Capacity and Practice Capacity | Michael Argenyi, MD            | 2016           |
| Learning from Physicians with Disabilities and Their Patients            | DeLisa and Lindenthal         | 2016           |
| Unjustified Barriers for Medical School Applicants with Physical Disabilities | Stanley F. Wainapel, MD, MPH   | 2015           |
| Technical requirements to become an osteopathic physician               | Mark Sandhouse                 | 2014           |
| Reflections on Diversity and Inclusion in Medical Education             | DeLisa and Lindenthal         | 2012           |
| North American Medical Schools’ Experience With and Approaches to the Needs of Students With Physical and Sensory Disabilities | Eickmeyer, Do, Kirschner, and Curry | 2012 |
| Technical Standards for Admission to Medical School: Deaf Candidates Don’t Get No Respect | Michael Schwartz              | 2009           |
| Physicians with Disabilities and the Physician Workforce: A Need to Reassess Our Policies | DeLisa and Thomas              | 2005           |
| Technical standards for the education of physicians with physical disabilities: perspectives of medical students, residents, and attending physicians | Van Matre, Nampiaparampil, Curry, and Kirschner | 2004 |
| Learning Disabilities, Professionalism, and the Practice of Medical Education | Hafferty and Gibson            | 2003           |
| Association Guidelines                                                   |                                |                |
| Accessibility, Inclusion, and Action in Medical Education: Lived Experiences of Learners and Physicians With Disabilities | Meeks and Jain                 | 2018           |
| Recommended Technical Standards for Colleges of Osteopathic Medicine     | Educational Council on Osteopathic Principles (ECOP) for the AACOM | 2014           |
focus on the “specific physical, cognitive, sensory, or behavioral abilities that a student must demonstrate, without accommodation,” placing process-oriented emphasis on sensorimotor skills rather than cognitive abilities. Conversely, functional technical standards focus on competency outcomes without delineating how a student achieves these outcomes and allowing for accommodations including intermediaries and assistive technologies. Functional standards are further supported by Kezar and colleagues who offer an exemplar for medical schools seeking to align their technical standards with the aforementioned guidance.

The most recent publication on the topic calls for a reassessment of technical standards entirely, arguing that the move to competency-based medical education renders technical standards obsolete and unnecessary. Instead the authors propose that decision-making regarding disability accommodation and proficiency should be situated squarely in the individual competencies for completing the degree program versus the technical standards.

Newly developed technical standards have not been evaluated for improved practices. The addition of 15 new US MD and DO medical schools in the last three years provides an opportunity to evaluate newly developed technical standards to assess the adoption of more inclusive standards, as recommended in the literature. In this study the authors evaluated technical standards from 15 new medical schools whose inaugural classes matriculated between 2017 and 2020. Using an analytical framework like that used in a previous study, the authors evaluated technical standards for (1) willingness to accommodate, (2) functional level required across hearing, vision, and mobility, and (3) the locus of responsibility for providing accommodations.

**Methods**

**Design**

Two authors familiar with evaluating technical standards (B.C. and C.M.) oversaw the study design. We conducted a document analysis of written technical standards of newly established US MD- and DO-granting medical schools and examined each school’s technical standards for inclusive language and attitudes related to visual, auditory, and mobility disabilities. We utilized LCME and COCA websites to identify schools whose inaugural class began between 2017 and 2020. Fifteen medical schools fit the inclusion criteria (US MD or DO program whose inaugural class began between 2017 and 2020) and were evaluated in this study. This timeframe was chosen to reflect the period following publication of the previous study from Zazove et al.

**Data Collection and Database Construction**

From June 2020 to September 2020, we conducted an online search to obtain technical standards from the 15 eligible schools. One author (C.S.) navigated to each school’s official website and attempted to locate the technical standards using the provided menus and submenus. If the technical standards were unavailable via these menus, the school’s website search function was used to search for “technical standards.” If this method failed to locate the technical standards, the author performed a Google search for “[school name] technical standards.” All schools maintained publicly available copies of the technical standards on their respective websites. Each school
was then classified based on the relative ease of obtaining the technical standards.

Schools were coded as Easy if their technical standards were found within five minutes using the school website menus and submenus, Moderately Difficult if the search took 5 to 20 min and/or required use of the school website search function. Finally, schools were coded as Very Difficult when finding their standards took more than 20 min and/or required a Google search. We chose these criteria in order to directly compare results with previous studies and because difficulties locating technical standards may send unintended messaging that students with disabilities are not welcome. Finally, we recorded demographic data about each school including their private or public status, geographic location of the school, and class size. Technical standards from all sources were entered verbatim into a Microsoft Excel database version 16.34.

### Data Abstraction Procedures

Technical standards were evaluated using content analysis and followed the coding scheme used in the 2016 study. This scheme focuses on three domains, including (1) willingness to provide accommodations, (2) functional requirements for each disability category, and (3) locus of responsibility for providing accommodations.

The first domain examined the school’s willingness to provide accommodations in compliance with the Rehabilitation Act of 1973. Schools identified as Supportive included written statements regarding their intent to accommodate applicants with disabilities. If no clear statement about accommodations was found in the technical standards, or if the technical standards contained negative or unsupportive language surrounding the need for accommodations, the school was deemed Equivocal, or Unsupportive, respectively. Technical standards that contained contradictory information or had language that alternated equally between Supportive and Unsupportive were also coded as Equivocal. Criteria for willingness to accommodate are shown in Table 2.

The second domain examined functional requirements for three categories of disability. This domain examines language surrounding the abilities that a student must display across three separate skill areas: hearing, vision, and mobility. For example, schools that were coded as requiring full function, without accommodations, in the domain of hearing mandated the ability to hear and speak without explicitly allowing for a functional equivalent. Conversely, technical standards that allowed for the use of accommodations or specified that a functional equivalent was allowable were coded as requiring full function but with accommodations. While the spectrum of disability clearly extends beyond the three modalities of hearing, vision, and motor skills, we chose to focus our analysis on these as they are the three modalities most often discussed in subdomains of technical standards.

The third domain examined locus of responsibility for providing accommodations: whether the school, the student, or both in partnership were responsible for providing accommodations. This domain also examined the school’s willingness to provide two specific types of accommodations: intermediaries (eg, physical intermediary, sign language interpreter) and auxiliary aids (eg, digital stethoscope). These interventions often fall under the category of “reasonable accommodations,” eg, modifications that do not fundamentally alter an academic program or interfere with essential academic instruction. Finally, the authors compared findings from the sample of new schools’ technical standards to those from the 2016 findings of US medical schools to investigate changes in practice.

### Data Coding

Analysis was performed on collected Technical Standards with iterative coding. The lead author (C.S.) utilized the descriptors (Table 2) to code for willingness to provide accommodations, and then independently applied the scheme to all 15 new schools. A second author (B.C.) performed independent coding on the new schools by which to triangulate the results. Coding was conducted for two schools first, to confirm coding scheme and review any queries, followed by a full coding of all 15 schools. No coding discrepancies occurred. The University of Michigan institutional review board exempted this study.

### Results

Deidentified demographic data for each school and a summary of results are presented in Table 3. Four of the MD schools in the study were public and six were private, while four out of five of the DO schools were private. Two schools were in the Northeast, six in the South, six in the West, and one in the Midwest. All the MD schools enrolled less than 100 students per class at the time of the study. The DO schools in this study had larger average class sizes, with four out of the five schools having class sizes greater than 150 students.

All 15 medical schools included in this analysis maintained publicly available copies of their technical standards on their website. Despite being publicly available, 11 of the 15 technical standards (73%) were at least “Moderately Difficult” to find. Technical standards were often hidden within Student Handbook PDFs or buried in multiple sub-menus on the website.

In the category of willingness to provide accommodations, most schools in this study were coded as restrictive (53%), while four (33%) were coded as equivocal and two (13%) were coded as supportive.

Six of the 15 schools (40%) in this study had explicit restrictions on the use of intermediaries in their technical standards. Eleven (73%) used restrictive language suggesting that they would require full function for hearing and mobility, and 12 (80%) schools did the same for vision, as determined by
organic standards focusing on specific abilities to be demonstrated; examples included quotes such as: “Applicants and students should be able to speak, hear, and observe patients,” (School 11) or “The candidate must have both physical and mental endurance to adapt to extended periods of sitting, standing…” (School 6). The remaining schools used more supportive language when describing necessary competencies; an example included “Candidates must be able to accurately acquire information from patients and assess findings. They must be able to perform a complete physical examination…These skills require the use of vision, hearing, and touch or the functional equivalent” (School 2).

Three schools (20%) explicitly mentioned that auxiliary aids to supplement hearing, vision, and mobility were permissible. A fourth school did not directly comment on auxiliary aids but did note that “hearing-impaired stethoscopes” could be used. No school in this study explicitly forbade the use of assistive technologies as the remaining 11 schools (73%) did not mention auxiliary aids.

Nine schools (60%) mentioned locus of responsibility for providing accommodations, compared to only 40% of schools providing this information in a previous study. Of these, all (100%) stated that responsibility would be shared between the student and the school, where a school would work with the student to provide accommodations once a student self-identified their disability. Although the locus of responsibility was shared, the means of reporting a disability varied widely, with five schools (33%) requiring disclosure to a Disability Office, two schools (13%) to Academic Affairs, one school (6%) to Student Affairs, and one school (6%) to Admissions.

**Discussion**

Our findings indicate that despite robust discussions and guidance on the need to develop more inclusive technical standards, with numerous court cases challenging medical schools’ restrictions of accommodations for students with disabilities, newer medical schools maintain restrictive technical standards that are difficult to locate, and model historical—rather than updated—guidance, which may serve as continued barriers to inclusive medical education.

Many of the technical standards reviewed in this study contain a disconnect between supportive attitudes toward students with disabilities and the restrictive language in the subsequent text. For example, one school (School 3) in this study stated that “These Standards are not intended to deter any student who might be able to complete the requirements of the curriculum with reasonable accommodations,” yet did not permit the use of an intermediary. Recent literature suggests that intermediaries do not mediate a student’s own judgment and may be...
appropriate in some situations. Further, the law requires schools to engage in an interactive process to determine reasonable accommodations.\textsuperscript{5,28} The overtly stated refusal to consider intermediaries by any program without a proper evaluation of the reasonable nature of such an accommodation contrasts with legal mandates.

Newer schools’ administrators may be unaware of the barriers that technical standards pose to students with disabilities. Although each set of standards evaluated in this study had a statement about compliance with the ADA and Rehabilitation Act or a pledge of nondiscrimination toward “otherwise qualified applicants,” many included restrictive language making it difficult for an otherwise qualified applicant with a disability to complete the curriculum, despite the stated goal of nondiscrimination. This suggests that schools may aim for legal compliance in language, without consideration for the application of the requirement to allow for reasonable accommodation.

Most schools’ technical standards did not explicitly discuss whether students could use auxiliary aids. Only three schools specifically mentioned the use of “technology” or “prosthetics” in the context of promoting equal educational opportunities. While no school outright barred auxiliary aids, the lack of a clear statement allowing the use of assistive technologies may cause a prospective student to question if an accommodation will be acceptable. As a result, the burden is placed on a prospective student to interpret the technical standards to determine their eligibility, while they still have minimal knowledge about or practice with the specific clinical skills needed as healthcare students and future professionals.\textsuperscript{11}

Schools with technical standards that were coded as supportive had language that welcomed students with disabilities. For example, one school (School 8) had a landing page entitled “Support for Disabled Students” linking to technical standards under the headline “You’ll Be Welcomed Here.” In contrast, schools with restrictive technical standards used language excluding intermediaries and included statements such as, “essential abilities are listed below and cannot be altered without fundamentally risking patient safety and the well-being of patients” (School 1). For prospective students whose first interaction with schools might be through the technical standards, this language may serve as a deterrent from applying at all. Four schools had technical standards which were coded as equivocal given language that could be perceived as absolutist, but also made space to allow for accommodations. For example, one school stated, “All candidates...must be able to perform specific essential functions and possess characteristics including certain minimum physical and cognitive abilities, as well as sufficient mental and emotional stability to assure that candidates can complete the entire course of study and participate fully in all aspects of medical training with or without reasonable accommodations” (School 10).

This study has limitations. First, schools may have updated their technical standards in the year since the analysis was completed. Also, qualitative coding contains a small measure of subjectivity, though we replicated codes and methodology from a previous study\textsuperscript{7} and employed two independent coders for triangulation with 100% inter-coder reliability. Finally, a school’s technical standards may not fully represent actual experiences regarding disability inclusion, although they are precisely what potential and accepted students see as a school’s public-facing policy and therefore represent to the best of their knowledge how the school intends to approach a student with disability during those four years in medical school. As the AAMC has added disability items to their second-year questionnaire, future studies from those data will be able to better describe the experience of the disabled medical student while in school and rationale for non-disclosure.

This study provides access to prior works addressing technical standards (Table 1) to highlight salient points. First, several templates exist to assist schools in building inclusive technical standards.\textsuperscript{10,30,31} Second, schools should focus on “functional” or competency-based technical standards, emphasizing educational and healthcare outcomes, rather than “organic” standards that overemphasize how the skill is performed.\textsuperscript{6,8} Finally, technical standards should include explicit language that welcomes applicants with disabilities and allows the use of auxiliary aids and intermediaries, as appropriate.\textsuperscript{32} The addition of these items would reduce confusion and may encourage more students with disabilities to apply.

Conclusions

Despite the recent attention given to technical standards and students with disabilities, it appears that newer schools, much like their more established counterparts, are still employing language in their technical standards that is discriminatory and unsupportive of disability inclusion. Indeed, the lack of availability and transparency of technical standards, along with their restrictive language, serve to create a hidden curriculum around disability by sending implicit messages about the appropriateness of including students with disabilities.\textsuperscript{33} As a result, schools undermine their efforts to increase diversity in the medical field and continue to promote barriers to professional entry in the field by people with disabilities. The implications are far-reaching for a population that represents 20% of the US population yet only 4.6% of US-MD and 4.27% of US-DO medical students.\textsuperscript{34,35} Oversight by accrediting agencies may be necessary to drive change in this area,\textsuperscript{36} including a set of LCME- and COCA-driven exemplar technical standards that reflect current technological advancements in assistive technology and inclusion language and concurrent verification from accrediting bodies that the technical standards comply with the Americans with Disabilities Act.
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Ethical Approval
Not applicable, because this article does not contain any studies with human or animal subjects.

Informed Consent
Not applicable, because this article does not contain any studies with human or animal subjects.

Trial Registration
Not applicable, because this article does not contain any clinical trials.

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