Postbaccalaureate Premedical Programs to Promote Physician-Workforce Diversity

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ABSTRACT
The need for greater diversity in the health-professions workforce is critical to drive excellence and to improve access to quality care for vulnerable and underserved populations. In the current higher education environment, postbaccalaureate premedical programs with a special focus on diversity, sustained through consistent institutional funding, may be an effective strategy to promote diversity, particularly physician-workforce diversity. In 2014, 71 of the 200 postbaccalaureate premedical programs (36%) in a national database identified themselves as focused on engaging groups underrepresented in medicine and/or economically or educationally disadvantaged students. Three such programs are described in detail, and current and future challenges and opportunities are discussed.

Keywords: underrepresented minorities • students • postbaccalaureate premedical programs • diversity

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INTRODUCTION

The need for a diverse health-professions workforce is well articulated (American Association of Colleges of Nursing, 2014; McGee, Saran, & Krulwich, 2012; Sullivan Commission, 2004; Urban Universities for Health, 2014). In particular, a diverse physician workforce will provide culturally competent care to all segments of the US population, advance our nation’s research agenda, and train future physicians (Association of American Medical Colleges [AAMC], 2010; Health Resources and Services Administration [HRSA], 2010; Institute of Medicine [IOM], 2003; Marrast, Zallman, Woolhandler, Bor, & McCormick, 2014; Saha, 2014). The Liaison Committee for Medical Education (LCME), the accrediting body for medical doctor (MD)-degree programs, recognizes the responsibility of medical schools and their affiliated institutions to promote a physician workforce that reflects our increasingly diverse US population in its accreditation standards (LCME, 2014a, 2014b, 2014c). For example, the Medical Student-8 (MS-8) standard pertains to broadening diversity of the national pool of qualified applicants for medical school admission (LCME, 2014a). The Institutional Setting-16 (IS-16) standard pertains to diversity at a specific institution; its definition of diversity may include economic, educational, racial, ethnic, and geographic factors, among others (LCME, 2014b). The revised framework for LCME-accreditation standards, effective July 1, 2015 (LCME, 2014c), retains these key aspects of MS-8 and IS-16 (LCME, 2014d). Postbaccalaureate premedical programs (PBPPs) that focus on diversity are among the approaches institutions may take to meet them.

Overview of Postbaccalaureate Premedical Programs

As of August 2014, the AAMC website (2014a) listed 200 PBPPs at institutions both with and without medical schools. Career changer (CC) programs enable college graduates to complete the premedical coursework required for medical school admission; academic record-enhancer (ARE) programs allow college graduates who have completed the required coursework to strengthen their academic credentials (AAMC, 2014a). Annually, several thousand PBPP participants subsequently enroll in US LCME-accredited medical schools. Of all 14,906 medical school matriculants who responded to the 2013 AAMC Matriculating Student Questionnaire (MSQ), 6.6 percent reported participation in an ARE PBPP, and 10 percent reported participation in a CC PBPP (AAMC, 2013a).

Nationally, PBPP participants who entered medical school from 1993 to 2000 comprised a diverse group (Andriole & Jeffe, 2011). At graduation, they were significantly more likely than their nonparticipant peers to plan to practice in underserved areas; ARE-PBPP participants were 1.14 times more likely, and CC-PBPP participants 1.47 times more likely (Andriole & Jeffe, 2011). These observations were cited in the amicus brief filed by AAMC et al. before the Supreme Court of the United States in Abigail Noel Fisher.
Petitioner, v. University of Texas at Austin, et al., Respondents (Brief for Amicus Curiae, 2012). This case challenged the school’s use of race in its undergraduate admissions process. The amicus brief in support of the respondents argued that diversity is a vital component of the educational mission of US medical schools. The value of PBPPs to participants and their medical career intentions as reported by Andriole and Jeffe (2011) provided supporting evidence for current medical education initiatives “to help achieve a diverse and culturally-competent student body and physician workforce” (Brief for Amicus Curiae, 2012).

In eight years, the number of PBPPs listed on the AAMC website nearly doubled, from 114 in 2006 (Ceccati & Hunter, 2006) to 200 in August 2014 (AAMC, 2014b). Viewers can search the database for each program’s characteristics, provided by school representatives. PBPPs vary widely in terms of curriculum, duration, and goals. Of the 200 listed, 120 (60%) were at private, and 80 (40%) at public institutions. All three major types of PBPPs were represented: 60 (30%) were CC-only; 65 (32%) were ARE-only; 63 (32%) were a combination; and 12 (6%) were not characterized as either. In addition, 71 (36%) characterized themselves as *diversity-focused programs*; that is, targeting groups underrepresented in medicine and/or economically or educationally disadvantaged students (Brewer & Grbic, 2010; Grumbach, 2011). These PBPPs may be of particular value to higher education institutions seeking to promote greater diversity in the health-professions workforce and to address diversity-related LCME-accreditation standards. The 71 programs included 36 of the 80 (45%) programs at public institutions and 35 of the 120 (29%) programs at private institutions. They comprised 28 of the 65 (43%) ARE-only programs; four of the 60 (7%) CC-only programs; 32 of the 63 (50%) CC + ARE programs; and 7 of the 12 (58%) programs not categorized as CC or ARE.

**Diversity-Focused Postbaccalaureate Premedical Programs**

Published studies about diversity-focused PBPPs include reports of individual programs (Giordani et al., 2001; Jackson, McGlinn, Rainey, & Bardo, 2003; Lipscomb, Fowler, Green, & Brooks, 2009; Lipscomb, Mullan, Zepeda, & Price, 1993; McDougle, Way, & Rucker, 2010; McDougle, Way, & Yash, 2008; McGlinn, Jackson, & Bardo, 1999; Whitten, 1999) and groups (Grumbach & Chen, 2006; Lupton, Ver Cammen-Grandjean, Forkin, Wilson, & Grumbach, 2012). The three most recently published single-program studies at Ohio State University (McDougle et al., 2010; Ohio State University College of Medicine, 2014), Southern Illinois University (Jackson et al., 2003; Southern Illinois University School of Medicine, 2014), and Michigan State University (Lipscomb et al., 2009; Michigan State University College of Human Medicine, 2014) include longitudinal observations of PBPP participants’ characteristics and outcomes, tracked at least through medical school graduation. Table 1 summarizes the data, and additional details about each program are described below.
Table 1. Characteristics of the Advanced Baccalaureate Learning Experience (ABLE), the Medical/Dental Education Preparatory Program (MEDPREP), and the Medical Pathways Postbaccalaureate Program (MEDPATH)

<table>
<thead>
<tr>
<th></th>
<th>ABLE</th>
<th>MEDPREP</th>
<th>MEDPATH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial year</td>
<td>1986</td>
<td>1972</td>
<td>1990</td>
</tr>
<tr>
<td>Duration, in years</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Number of enrollees</td>
<td>Up to 15</td>
<td>Up to 72 (36/cohorts)</td>
<td>Up to 15</td>
</tr>
<tr>
<td>In-state tuition &amp; fees, 2013-14</td>
<td>$12,166</td>
<td>$13,126/year</td>
<td>$11,925</td>
</tr>
<tr>
<td>Out-of-state tuition &amp; fees, 2013-14</td>
<td>Michigan State University College of Human Medicine</td>
<td>Southern Illinois University School of Medicine</td>
<td>Ohio State University College of Medicine</td>
</tr>
<tr>
<td>Institutional ownership</td>
<td>Public</td>
<td>Public</td>
<td>Public</td>
</tr>
<tr>
<td>Degree granted for completion?</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

*Lipscomb et al., 2009. aMichigan State University College of Human Medicine, 2014. bW. D. Lipscomb, personal communications, September 2014. cJackson et al., 2003. dSouthern Illinois University School of Medicine, 2014. eH. R. Bardo, personal communications, September 2014. fMcDougle et al., 2008. gL. McDougle, personal communications, September 2014.

MICHIGAN STATE UNIVERSITY ADVANCED BACCALAUREATE LEARNING EXPERIENCE (ABLE)

**Intent.** Enrolment is restricted to students from disadvantaged backgrounds, including students from groups underrepresented in medicine, who applied to Michigan State University College of Human Medicine, were not offered admission after interviews, but were subsequently referred as candidates for ABLE by the Michigan State University College of Human Medicine Committee on Admissions (Lipscomb et al., 2009). The committee makes these referrals as a part of its holistic review process. It identifies students from disadvantaged backgrounds who show promise academically, whose experiences align with the college’s mission, and who will best benefit from an additional year of basic science coursework.
Curriculum. The curriculum provides an intensive learning experience in two required phases: the ABLE Summer Institute (ASI) and the ABLE Academic Year Postbaccalaureate Experience. The Michigan State University College of Natural Science offers advanced coursework in the basic sciences; ABLE students are also enrolled in one medical school course per semester selected by medical school faculty: gross anatomy (fall) and medical neuroscience (spring). Students are challenged to demonstrate new approaches to learning and to improve their study skills and strategies (Lipscomb, 2009). Students who complete the program are accepted by Michigan State University College of Human Medicine if they meet the following conditions: 1) earn an overall cumulative grade point average (GPA) ≥ 3.2 in all postbaccalaureate classes, 2) pass two first-year medical courses with the grade set for medical students, and 3) participate in required Educational Development seminars and academic support programming throughout ABLE. (W. D. Lipscomb, personal communication, December 20, 2014).

Financial Support. Currently, Michigan State University College of Human Medicine covers all costs associated with the ABLE Summer Institute, including student stipends for living expenses. ABLE students are provided academic-year stipends that cover at least 75 percent of tuition and fees for both semesters. Additional financial aid eligibility is determined on an individual basis (W. D. Lipscomb, personal communication, September 17, 2014).

Outcomes. An 18-year retrospective analysis of short-term outcomes, including program completion and medical school entry, and intermediate-term outcomes, such as medical school completion, was conducted for all 178 ABLE participants from 1991-2008. Five who were offered admission chose to attend a different medical school; there are no pay-back requirements for ABLE participants who do not matriculate at Michigan State University College of Human Medicine. However, 167 (94%) successfully completed the program and matriculated at MSUCHM; 93 percent of them completed medical school, a rate almost identical to the 94 percent retention rate for other Michigan State University College of Human Medicine matriculants. Furthermore, 54 of all 107 (50%) ABLE alumni who entered graduate medical education (GME) by 2008 chose primary-care specialties (Lipscomb et al., 2009). Long-term follow-up data on ABLE participants’ GME completion and clinical-practice placement have not been published to date.

SOUTHERN ILLINOIS UNIVERSITY (SIU) MEDICAL/DENTAL EDUCATION PREPARATORY PROGRAM (MEDPREP)

Intent. MEDPREP is intended for students from groups underrepresented in medicine and economically and educationally disadvantaged backgrounds who have not been accepted by
health-professions schools and who seek to participate in a rigorous preparatory program to increase their likelihood of acceptance when they next apply (Jackson et al., 2003). Its mission is “to increase the numbers of underrepresented minority and disadvantaged students from southern and central Illinois who will enter and graduate from health professions schools and who will serve in U.S. health professions shortage areas” (SIU, 2014).

**Curriculum.** Year 1 of the two-year curriculum emphasizes content and skills covered by the Medical College Admissions Test (MCAT). Courses cover foundational concepts in biology, chemistry, and physics. In addition, a faculty member specializing in critical-reasoning skills teaches verbal reasoning and academic-enrichment skills to help students “learn how to learn.” In Year 2, with the assistance of academic advisors, students tailor their programs to strengthen their preparation for medical school, and they are encouraged to take several courses, such as biochemistry, physiology, anatomy, and pharmacology. Throughout the two-year program, students have frequent contact with MEDPREP’s full-time, licensed clinical counselor who teaches life skills and professionalism and provides emotional support (Jackson et al., 2003).

MEDPREP has a formal agreement with the SIU School of Medicine that allows direct entry. To qualify, students must achieve a criterion MCAT score (currently 24, the minimum score for all SIU School of Medicine applicants), fulfill the School of Medicine’s minimum GPA requirements (overall and science GPAs of 2.80), and be recommended by the MEDPREP Student Progress Committee (SPC) with “confidence” or “enthusiasm”, the highest of five recommendation levels. The SPC consists of MEDPREP faculty, the program counselor, and faculty from the School of Medicine. While SPC review is holistic, weighting both academic and nonacademic factors, students are expected to demonstrate their readiness for medical school by strong academic performance in the program (e.g., program GPAs of 3.5 or above and/or MCAT scores above 24) to attain the two highest levels of recommendation (A. M. Metz, personal communication, December 19, 2014).

**Financial Support.** SIU-Carbondale, where MEDPREP is located, awards 24 tuition waivers annually to help offset costs of participation (SIU College of Medicine, 2014). In addition, MEDPREP awards approximately twelve $500 to $1000 scholarships funded by donors annually (A. M. Metz, personal communication, December 19, 2014).

**Outcomes.** A 30-year retrospective analysis of MEDPREP short-term and intermediate-term outcomes was reported in 2003 (Jackson et al., 2003). Of the 1,059 students enrolled in MEDPREP from 1972-2002, 668 (63%) were accepted by professional schools (MD-degree granting medical schools, DO-degree granting medical schools, dental schools, and other health-professions schools); 612 (92%) were accepted by medical schools; and 662 (99%) of those accepted enrolled. Of all students tracked in the last decade of this study, 92 percent
had graduated or were on track to graduate from their health-professions school, which compares favorably with the 94 percent five-year graduation rate for all US medical students (Caulfield, Redden, & Sondheimer, 2014). From 2003-2012, an additional 334 students enrolled in MEDPREP; 270 were admitted to medical school and six to dental school (A. M. Metz, personal communication, December 19, 2014). Long-term data about GME specialty training, GME completion, and clinical practice setting for MEDPREP participants who enrolled in medical school are not available.

THE OHIO STATE UNIVERSITY COLLEGE OF MEDICINE (OSUCOM) MEDICAL CAREERS PATHWAY POSTBACCALAUREATE PROGRAM (MEDPATH)

**Intent.** MEDPATH aims to increase the number of medical school graduates from groups underrepresented in medicine and economically and educationally disadvantaged backgrounds. Eligibility is limited to students who applied to OSUCOM via the American Medical College Application Service and were not admitted to another medical school (McDougle et al., 2008).

**Curriculum.** MEDPATH begins with a two-week science review and assessment to develop a personalized curriculum. In addition, students are taught learning strategies, problem-solving, and test-taking skills. During the academic year (autumn, spring, and summer), they take courses taught by undergraduate faculty that include, but are not limited to, biochemistry, histology, genetics, physiology, medical terminology, medical ethics, pharmacology, and microbiology. Facilitated review sessions are provided for the most challenging courses. Community service projects, a mentoring program, and professional development sessions are other integral components. The final six-week summer component (Pre-Entry Program) on human anatomy and immunology is taught by faculty in the OSUCOM Anatomy department (McDougle et al., 2008). Conditional acceptance to OSUCOM is offered to MEDPATH completers with a GPA ≥ 3.0 in the MEDPATH curriculum and an MCAT score ≥ 25 during the MEDPATH spring semester (L. McDougle, personal communication, December 18, 2014).

**Financial Support.** Most enrolled students receive need-based tuition support from OSUCOM (McDougle et al., 2008; OSU College of Medicine, 2014).

**Outcomes.** To evaluate long-term outcomes (following completion of all GME training), a 2008 survey was administered to 47 MEDPATH graduates (two lost to follow-up) who graduated from OSUCOM from 1996-2002 and to a stratified (by graduation year), randomly selected control group of 56 OSUCOM graduates who did not participate in
MEDPATH. Surveys were completed by 73 of the 103 graduates (71%), including 34 (72%) of the 47 MEDPATH participants and 39 (70%) of the 56 nonparticipants. Compared with non-MEDPATH graduates, greater proportions of MEDPATH graduates reported practicing in a federally designated underserved area (29% versus 5%, p < .009), providing services where 40 percent or more of patients were medically indigent or poor (68% versus 33%, p < .003), and volunteering services to indigent patients (47% versus 10%, p < .001) (McDougle et al, 2010).

DISCUSSION

Similarities and Differences among ABLE, MEDPREP, and MEDPATH

Several common features of these PBPPs should be emphasized, as they inform our understanding of the components of successful, long-standing, diversity-focused PBPPs. Each program includes at least one year of full-time study and rigorous academic preparation. All three are multifaceted, with components focusing on participants’ professional development and personal well-being; strong student support services are integral. The institutional commitment to sustaining each program is displayed through consistent funding for administration and participant support. Notable differences include their size, eligibility and selection criteria, and specific coursework options for participants. Finally, other institutional efforts undertaken to promote diversity and inclusion may also contribute to the success of these PBPPs and their participants.

Challenges and Opportunities Ahead for Diversity-Focused Postbaccalaureate Premedical Programs

The authors identified challenges that face many types of educational programs, including financial sustainability, keeping participant costs manageable, and ensuring participants’ continued success after program completion. As illustrated by the three programs described here, maintaining PBPPs’ financial sustainability and keeping students’ costs manageable requires a strong institutional commitment. Curricula that include not only basic science coursework but also components to develop life-long learning skills help participants meet challenges they are likely to face in medical school and beyond.

Recent changes in federal regulations have implications for many educational programs, including PBPPs. Currently, not all PBPPs grant degrees. Of the 71 diversity-focused PBPPs in the AAMC database, 23 (32%) are explicitly called Masters-degree-granting programs (e.g., Master of Science in Modern Human Anatomy, Master of Biomedical Sciences) (AAMC, 2014b). Programs that do not grant degrees at public and nonprofit institutions participat-
ing in federally authorized student financial aid programs are now required to report program- and student-level data to the federal government (Bergeron, 2011). Degree-granting PBPPs might be particularly advantageous for students who are undecided about attending medical school and might consider employment opportunities or enrollment in a science PhD program after PBPP completion; the authors surmise that in the current regulatory environment, at least some PBPPs that do not grant degrees may consider changing.

At the state level, recently enacted laws limiting the extent to which race/ethnicity may be considered in participant selection for educational programs supported by public funds are driving changes in admissions approaches in affected states (Coleman, Lipper, & Keith, 2012). Voter-initiated state bans have been implemented in Arizona, California, Michigan, Nebraska, and Oklahoma; admissions-related bans have been adopted in Florida through administrative regulation and in New Hampshire and Washington through state statutes (Education Counsel LLC, 2014). In response to such state-enacted limitations, higher education institutions have taken a variety of alternative approaches to admissions, such as discontinuing legacy preferences that provided an advantage to children of alumni, who are disproportionately wealthy and white; facilitating transfer from community colleges to four-year institutions; expanding private financial aid programs and targeted recruitment programs; and increasing sensitivity to economic disadvantage among other permissible factors in a more holistic process (Kahlenberg, 2012). Health-professions schools, in particular, have adopted holistic admissions processes; the AAMC’s Advancing Holistic Review Initiative took the critical first steps by aligning legal and educational policies with specific, assessable implementation practices (AAMC, 2014c; Urban Universities for Health, 2014). According to a recently completed national survey of 228 health-professions schools at 104 universities (response rate = 64%), 93 percent of DDS/DMD, 91 percent of MD, 82 percent of MPH, 78 percent of PharmD, and 47 percent of BSN programs reported using holistic review (Urban Universities for Health, 2014).

Individuals and organizations involved in PBPPs have opportunities to collaborate nationally. In February 2010, the University of California Davis invited many PBPP representatives to a meeting sponsored by the California Endowment (Grumbach, 2011). Since this seminal meeting, a group of PBPP directors, many of them from diversity-focused programs with and without medical school affiliations, formed a National Post-baccalaureate Consortium (NPBC) to collectively address ongoing challenges and to identify and nationally disseminate best practices in admissions, curriculum design, and financial sustainability. In 2013, the AAMC Group on Student Affairs (GSA) identified the NPBC as an initiative of the GSA’s Committee on Diversity Affairs (AAMC, 2013b). The NPBC is expected to serve as a resource within the AAMC for individuals and institutions seeking to develop new PBPPs and to sustain and improve previously established, particularly diversity-focused, PBPPs.
Conclusions

About one-third of the 200 PBPPs included in a national data base describe themselves as having a special focus on groups underrepresented in medicine and/or economically or educationally disadvantaged students; such programs have the potential to promote greater physician workforce diversity. The evidence base for this role of PBPPs would be strengthened by national, multi-institutional studies that examine a shared set of short-term, intermediate, and long-term outcomes. Analysis of such outcomes in the context of individual, PBPP-specific selection criteria, curricula, and goals would clarify the key characteristics of PBPPs that are most successful in promoting physician-workforce diversity. The authors note that further efforts are under way to develop and implement postbaccalaureate programs that address diversity in the biomedical research workforce (McGee, Saran, & Krulwich, 2012). For example, the Postbaccalaureate Research Education Programs (PREPs) funded by the National Institute of General Medical Sciences encourage students from underrepresented groups who already have science baccalaureate degrees to pursue research doctorates and to study “health problems that disproportionately affect minorities and the medically underserved in the United States” (National Institutes of Health, 2014). Thus, a future direction for research is to examine whether successful aspects of diversity-focused PBPPs addressing one component of the health-professions workforce can be translated to other components.

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