

# The Leaky Pipeline: A Narrative Review of Diversity in Dermatology

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## PRACTICE POINTS

- Dermatology remains the second least diverse specialty in medicine, which has important implications for the workforce and clinical excellence of the specialty.
- Barriers presenting at different stages of medical education and training result in the loss of underrepresented minority (URM) learners pursuing or advancing careers in dermatology.
- Understanding these barriers is the first step to creating and implementing important structural changes to the way we mentor, teach, and support URM students in the specialty.

Dermatology remains the second least diverse specialty in medicine. This lack of diversity has important implications for the future of the specialty. This narrative review provides updated evidence on barriers at different stages of medical education training that impede academic advancement for underrepresented minority (URM) learners pursuing careers in dermatology.

*Cutis.* 2022;109:27-31, E1.

With a majority-minority population expected in the United States by 2044, improving diversity and cultural competency in the dermatology workforce is now more important than ever. A more diverse workforce increases the cultural competence of all providers, provides greater opportunities for mentorship

and sponsorship of underrepresented minority (URM) trainees, establishes a more inclusive environment for learners, and enhances the knowledge and productivity of the workforce.<sup>1-3</sup> Additionally, it is imperative to address clinical care disparities seen in minority patients in dermatology, including treatment of skin cancer, psoriasis, acne, atopic dermatitis, and other diseases.<sup>4-7</sup>

Despite the attention that has been devoted to improving diversity in medicine,<sup>8-10</sup> dermatology remains one of the least diverse specialties, prompting additional calls to action within the field.<sup>11</sup> Why does the lack of diversity still exist in dermatology, and what is the path to correcting this problem? In this article, we review the evidence of diversity barriers at different stages of medical education training that may impede academic advancement for minority learners pursuing careers in dermatology.

## Undergraduate Medical Education

The term *leaky pipeline* refers to the progressive decline in the number of URMs along a given career path, including in dermatology. The Association of American Medical Colleges defines URMs as racial/ethnic populations that are “underrepresented in the medical profession relative to their numbers in the general population.”<sup>9</sup> The first leak in the pipeline is that URMs are not applying to medical school. From 2002 and 2017, rates of both application and matriculation to medical school were lower by 30% to 70% in URM groups compared to White students, including Hispanic, Black, and American Indian/Alaska Native students.<sup>12,13</sup> The decision not to apply to medical school was greater in URM undergraduate

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The authors report no conflict of interest.

The eFigure is available in the Appendix online at [www.mdedge.com/dermatology](http://www.mdedge.com/dermatology).

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doi:10.12788/cutis.0427

students irrespective of scholastic ability as measured by SAT scores.<sup>14</sup>

A striking statistic is that the number of Black men matriculating into medical school in 2014 was less than it was in 1978 despite the increase in the number of US medical schools and efforts to recruit more diverse student populations. The Association of American Medical Colleges identified potential reasons for this decline, including poor early education, lack of mentorship, negative perceptions of Black men due to racial stereotypes, and lack of financial and academic resources to support the application process.<sup>8,13,15-17</sup> Implicit racial bias by admission committees also may play a role.

### Medical School Matriculation and Applying to Dermatology Residency

There is greater representation of URM students in medical school than in dermatology residency, which means URM students are either not applying to dermatology programs or they are not matching into the specialty. In the Electronic Residency Application Service's 2016-2017 application cycle (N=776), there were 76 (9.8%) URM dermatology residency applicants.<sup>18</sup> In 2018, there was a notable decline in representation of Black students among residency applicants (4.9%) to matched residents (3.7%), and there were only 133 (9.3%) URM dermatology residents in total (PGY2-PGY4 classes).<sup>19</sup> The lack of exposure to medical subspecialties and the recommendation by medical schools for URM medical students to pursue careers in primary care have been cited as reasons that these students may not apply to residency programs in specialty care.<sup>20,21</sup> The presence of an Accreditation Council for Graduate Medical Education dermatology residency program, fellowships, and dermatology interest groups at their medical schools correlated with higher proportions of URM students applying to dermatology programs.<sup>20</sup>

Underrepresented minority students face critical challenges during medical school, including receiving lower grades in both standardized and school-designated assessments and clerkship grades.<sup>21,22</sup> A 2019 National Board of Medical Examiners study found that Hispanic and Black test takers scored 12.1 and 16.6 points lower than White men, respectively, on the US Medical Licensing Examination (USMLE) Step 1.<sup>23</sup> Black and Asian students also were less likely than White students to be selected as members of the Alpha Omega Alpha Honor Medical Society (ΑΩΑ), even after accounting for USMLE Step 1 scores, research productivity, community service, leadership, and Gold Humanism Honor Society membership.<sup>24</sup> Taken together, the emphasis on clinical grades, USMLE scores, and ΑΩΑ status as recruitment and selection criteria likely deters URM students from applying to and may preclude them from successfully matching into highly selective specialties such as dermatology.<sup>25</sup>

A recent cross-sectional study showed that lack of equitable resources, lack of support, financial constrictions, and lack of group identity were 4 barriers to URM

students matching into dermatology.<sup>26</sup> Dermatology is a competitive specialty with the highest median Electronic Residency Application Service applications submitted per US applicant (n=90)<sup>27</sup> and an approximate total cost per US applicant of \$10,781.<sup>28,29</sup> Disadvantaged URM applicants noted relying on loans while non-URM applicants cited family financial support as being beneficial.<sup>26</sup> In addition, an increasing number of applicants take gap years for research, which pose additional costs for finances and resources. In contrast, mentorship and participation in pipeline/enrichment programs were factors associated with URM students matching into dermatology.<sup>26</sup>

### Dermatology Residency and the Transition to Advanced Dermatology Fellowships

Similar to the transition from medical school into dermatology residency, URM dermatology residents are either not applying to fellowships or are not getting in. In the 2018-2019 academic year, there were no Black, Hispanic, Native Hawaiian/Pacific Islander, or American Indian/Alaska Native Mohs micrographic surgery and dermatologic oncology fellows.<sup>19</sup> Similarly, there were no Black, Native Hawaiian/Pacific Islander, or American Indian/Alaska Native dermatopathology fellows. There were 4 (6%) Hispanic dermatopathology fellows.<sup>19</sup>

There also is marked underrepresentation of minority groups—and minimal growth over time—in the dermatology procedural subspecialty. Whereas the percentage of female Mohs surgeons increased considerably from 1985 to 2005 (12.7% to 40.9%, respectively), the percentage of URM Mohs surgeons remained steady from 4.2% to 4.6%, respectively, and remained at 4.5% in 2014.<sup>30</sup>

There are no available data on the race/ethnicity of fellowship applicants, as these demographic data for the application process have not been consistently or traditionally collected. The reasons why there are so few URM dermatology fellows is not known; whether this is due to a lack of mentorship or whether other factors lead to residents not applying for advanced training needs further study. Financial factors related to prolonged training, which include lower salaries and delayed loan repayment, may present barriers to applying to fellowships.

### Lack of URM Academic Faculty in Dermatology

At the academic faculty level, URM representation continues to worsen. Lett et al<sup>31</sup> found that there is declining racial and ethnic representation in clinical academic medicine relative to US census data for 16 US medical specialties, including dermatology, with growing underrepresentation of Black and Hispanic faculty at the associate professor and full professor levels and underrepresentation in all faculty ranks. From 1970 to 2018, URM faculty in dermatology only increased from 4.8% to 7.4%, respectively. Non-URM female and male faculty members increased by 13.8 and 10.8 faculty members per year, respectively, while URM female and male faculty

members increased by 1.2 and 0.8 faculty members per year, respectively.<sup>32</sup>

Underrepresentation of minorities seen in dermatology faculty may result from clinical demands, minority taxation (defined as the extensive service requirements uniquely experienced by URM faculty to disproportionately serve as representatives on academic committees and to mentor URM students), and barriers to academic promotion, which are challenges uniquely encountered by URM faculty in academic dermatology.<sup>33</sup> Increased clinical demand may result from the fact that URM physicians are more likely to care for underserved populations, those of lower socioeconomic status, non-English-speaking patients, those on Medicaid, and those who are uninsured, which may impact remuneration. Minority tax experienced by URM faculty includes mentoring URM medical students, providing cultural expertise to departments and institutions, and participating in community service projects and outreach programs. Specifically, many institutional committees require the participation of a URM member, resulting in URM faculty members experiencing higher committee service burden. Many, if not all, of these responsibilities often are not compensated through salary or academic promotion.

### A Call to Action

There are several steps that can be taken to create a pathway to dermatology that is inclusive, flexible, and supportive of URM.

- **Increase early exposure to dermatology in medical school.** Early exposure and mentorship opportunities are associated with higher rates of students pursuing specialty field careers.<sup>34</sup> Increased early opportunities allow for URM students to consider and explore a career in dermatology; receive mentorship; and ensure that dermatology, including topics related to skin of color (SOC), is incorporated into their learning. The American Academy of Dermatology has contributed to these efforts by its presence at every national meeting of the Student National Medical Association and Latino Medical Student Association, as well as its involvement with Nth Dimensions, which offers various educational opportunities for URM medical students.

- **Implement equitable grading and holistic review processes in medical school.** Racial/ethnic differences in clinical grading and standardized test scores in medical school demonstrate why holistic review of dermatology residency applicants is needed and why other metrics such as USMLE scores and AOA status should be de-emphasized or eliminated when evaluating candidates. To support equity, many medical schools have eliminated honors grading, and some schools have eliminated AOA distinction.

- **Increase diversity of dermatology residents and residency programs.** Implicit bias training for a medical school admissions committee has been shown to increase diversity in medical school enrollment.<sup>35</sup> Whether implicit

bias training and other diversity training may benefit dermatology residency selection must be examined, including study of unintended consequences, such as reduced diversity, increased microaggressions toward minority colleagues, and the illusion of fairness.<sup>36-39</sup> Increasing representation is not sufficient—creating inclusive residency training environments is a critical parallel aim. Prioritizing diversity in dermatology residency recruitment is imperative. Creating dermatology residency positions specifically for URM residents may be an important option, as done at the University of Pennsylvania (Philadelphia, Pennsylvania) and Duke University (Durham, North Carolina).

- **Create effective programs for URM mentorship.**

Due to the competitive nature of dermatology residency, the need for mentors in dermatology is critically vital for URM medical students, especially those without a home dermatology program at their medical school. Further development of formal mentorship and pipeline programs is essential at both the local and national levels. Some national examples of these initiatives include diversity mentorship programs offered by the American Academy of Dermatology, Skin of Color Society, Women's Dermatologic Society, and Student National Medical Association. Many institutional programs also offer invaluable opportunities, such as the summer research fellowship at the University of California, San Francisco (UCSF); visiting clerkship grants for URM at the University of Pennsylvania (Philadelphia, Pennsylvania) and Johns Hopkins University (Baltimore, Maryland); and integrated programs, such as the Visiting Elective Scholarship Program at UCSF, which provides funding and faculty mentorship for URM students completing an away rotation at UCSF.

- **Establish longitudinal skin-of-color curricula and increased opportunities for research.** More robust SOC training may lead to an increasingly diverse workforce. It is important that medical student and dermatology resident and fellow education include training on SOC to ensure high-quality care to diverse patient populations, which also may enhance the knowledge of trainees, encourage clinical and research interest in this field, and reduce health care disparities. Increasing research opportunities and offering formalized longitudinal training in SOC as well as incorporating more diverse images in medical school education may foster greater interest in this field at a time when trainees are establishing their career interests. At present, there is considerable room for improvement. Nijhawan et al<sup>40</sup> surveyed 63 dermatology chief residents and 41 program directors and found only 14.3% and 14.6%, respectively, reported having an expert who conducts clinic specializing in SOC. Only 52.4% and 65.9% reported having didactic sessions or lectures focused on SOC diseases, and 30.2% and 12.2% reported having a dedicated rotation for residents to gain experience in SOC.<sup>40</sup> A more recent study showed that when faculty were asked to incorporate more SOC content

into lectures, the most commonly identified barrier to implementation was a lack of SOC images.<sup>41</sup> Additionally, there remains a paucity of published research on this topic, with SOC articles representing only 2.7% of the literature.<sup>42</sup> These numbers demonstrate the continued need for a more inclusive and comprehensive curriculum in dermatology residency programs and more robust funding for SOC research.

• **Recruit and support URM faculty.** Increasing diversity in dermatology residency programs likely will increase the number of potential URMs pursuing additional fellowship training and academic dermatology with active career mentorship and support. In addition, promoting faculty retention by combatting the progressive loss of URMs at all faculty levels is paramount. Mentorship for URM physicians has been shown to play a key role in the decision to pursue academic medicine as well as academic productivity and job satisfaction.<sup>43,44</sup> The visibility, cultural competency, clinical work, academic productivity, and mentorship efforts that URM faculty provide are essential to enhancing patient care, teaching diverse groups of learners, and recruiting more diverse trainees. Protected time to participate in professional development opportunities has been shown to improve recruitment and retention of URM faculty and offer additional opportunities for junior faculty to find mentors.<sup>35,36</sup> Incentivizing clinical care of underserved populations also may augment financial stability for URM physicians who choose to care for these patients. Finally, diversity work and community service should be legitimized and count toward faculty promotion.

## Conclusion

There are numerous factors that contribute to the leaky pipeline in dermatology (eFigure). Many challenges that are unique to the URM population disadvantage these students from entering medical school, applying to dermatology residency, matching into dermatology fellowships, pursuing and staying in faculty positions, and achieving faculty advancement into leadership positions. With each progressive step along this trajectory, there is less minority representation. All dermatologists, regardless of race/ethnicity, need to play an active role and must prioritize diversity, equity, and inclusion efforts at all levels of education and training for the betterment of the specialty.

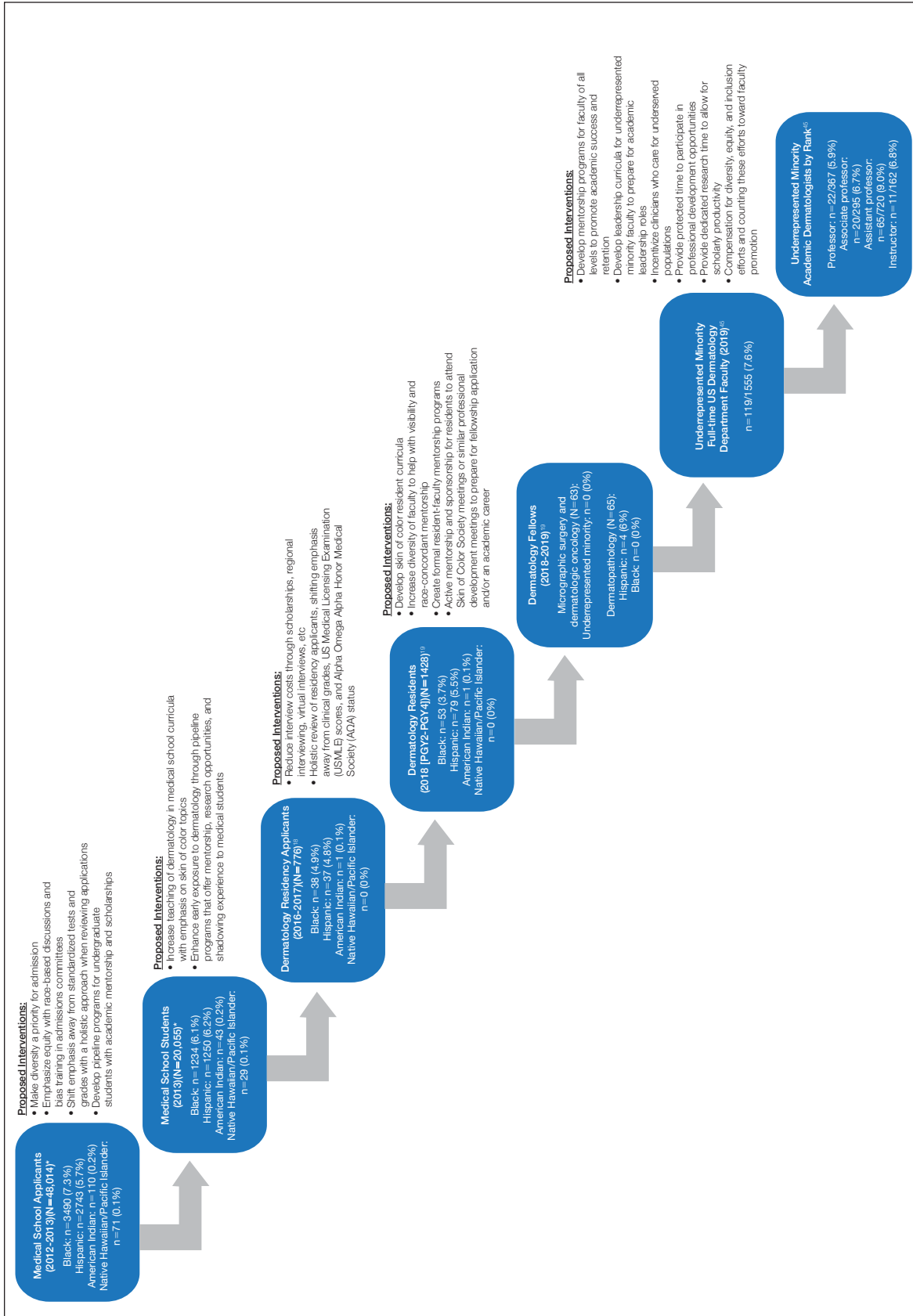
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APPENDIX



**eFIGURE.** Schematic of the leaky pipeline in dermatology and potential action items and solutions at each stage of academic development. Asterisk indicates unpublished data, Association of American Medical Colleges Diversity in Medicine: Facts and Figures, 2013.