

ACADEMIC MEDICINE

Journal of the Association of American Medical Colleges

Uncomposed, edited manuscript published online ahead of print.

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DOI: 10.1097/ACM.00000000000003496

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Changing How Race Is Portrayed in Medical Education: Recommendations From Medical Students

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Acknowledgments: The authors wish to acknowledge the students and faculty at the University of Washington School of Medicine in Seattle, Washington, who provided comments on an early draft of this manuscript.

Funding/Support: B.C. was supported by a Medical Scientist Training Program grant from the National Institute of General Medical Sciences of the National Institutes of Health under award number T32GM007739 to the Weill Cornell/Rockefeller/Sloan Kettering Tri-Institutional MD-PhD Program.

Other disclosures: None reported

Ethical approval: Reported as not applicable.

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Abstract

The medical community has been complicit in legitimizing claims of racial difference throughout the history of the United States. Unfortunately, a rigorous examination of the role medicine plays in perpetuating inequity across racial lines is often missing in medical school curricula due to time constraints and other challenges inherent to medical education. The imprecise use of race—a social construct—as a proxy for pathology in medical education is a vestige of institutionalized racism. Recent examples are presented that illustrate how attributing outcomes to race may contribute to bias and unequal care. This paper proposes the following recommendations for guiding efforts to mitigate the adverse effects associated with the use of race in medical education: emphasize the need for incoming students to be familiar with how race can influence health outcomes; provide opportunities to hold open conversations about race in medicine among medical school faculty, students, and staff; craft and implement protocols that address and correct the inappropriate use of race in medical school classes and course materials; and encourage a large cultural shift within the field of medicine. Adoption of an interdisciplinary approach that taps into many fields, including ethics, history, sociology, evolutionary genetics, and public health is a necessary step for cultivating more thoughtful physicians who will be better prepared to care for patients of all racial and ethnic backgrounds.

Medicine in the United States has a past burdened with countless reiterations of abuse and discrimination toward people belonging to racial and ethnic minority groups. Remnants of this troubling history continue to haunt the medical community in various places from undergraduate medical education to modern clinical practice. Embedded in a country struggling to resolve its own tribulations of racial inequality,¹ academic health systems remain entrenched in inherited modes of institutionalized racism. Given the increasing demands of medical education and the challenges of creating comprehensive medical curricula, institutions can be limited in the time they dedicate to a rigorous examination of the history of race in medicine or the problematic ways this history pervades modern clinical practice. This time constraint has led to an acceptance at face value of the oversimplification of race and disease presentation common in medicine today.² In this paper, we outline how race continues to influence medical institutions by presenting a brief historical account that serves as context, followed by an examination of the ways race can be used in medical education to perpetuate a narrative of racial difference that continues to the present day, as illustrated by several recent studies. We conclude with recommendations that will help cultivate physicians who are better prepared to care for patients of all racial or ethnic backgrounds, especially those belonging to groups that have been historically mistreated.

Historical Context of Race in Medicine

In our experience as medical students, medical education highlights major moments in medical history but rarely puts them in the context of the broader history of the United States, especially with respect to race relations. A broader historical view is necessary to recognize the medical community's complicity in legitimizing claims of racial difference, often at the expense of racial or ethnic minority groups. With this awareness, we can trace a thread from the injustices of the

past to similar current injustices that illustrate the importance of understanding how race is presented in scientific studies and in contemporary medical education.

Any examination of race and medicine in the United States must begin with slavery. Starting in 1619, slaves quickly became indispensable to the rapidly expanding economy of the colonies. This act of subjugation was justified by theories on how individuals differed. Several religious explanations were first conjured up. Scientists then followed in the 18th century with a theory called *polygenesis*.³ As Henry Louis Gates Jr. notes in *Stony the Road: Reconstruction, White Supremacy, and the Rise of Jim Crow*, “Polygenesis grew in popularity during this period because it matched the broader ideological needs of both scientists and nonscientists alike, who sought justification for their racial beliefs and the larger social order.”⁴

Louis Aggasiz, a Swiss-American professor at Harvard University, was a major proponent of this new theory and argued that people of different races were of different species altogether.⁵ In the early 19th century, Samuel Morton, a prominent physician in Philadelphia, found inspiration in Aggasiz’s theories for his book reporting that cranial differences among whites, blacks, and Native Americans could be used to predict certain characteristics. He described Africans as “joyous, flexible, and indolent,” noting that “the many nations which compose this race [African] present a singular diversity of intellectual character, of which the far extreme is the lowest grade of humanity.”⁶ Samuel Cartwright, another physician practicing in the South, published “Report on the Diseases and Physical Peculiarities of the Negro Race,” reporting diseases unique to black people, which included a particular ailment that caused “negroes to run away.”⁷ Around the same time Josiah C. Nott, also a physician, published a book with a British ethnologist that provided further “scientific” evidence that different races were of different origins.⁸ These publications provided a scientific foundation for what became the Jim Crow laws.⁴

At the turn of the 20th century, the medical community remained involved in promoting racial differences. The American eugenics movement borrowed genetic language to align itself with public health causes, suggesting that faulty genes should be actively selected out, often targeting minority racial or ethnic groups and individuals with disabilities.⁹ Physicians were again leading many of these efforts, with supporters such as Oliver Wendell Holmes Sr.¹⁰ Some have stipulated that the eugenics teachings from this time directly contributed to the initiation and continuation of the unethical Tuskegee syphilis experiment years later.^{11,12} This history showcases how the work of physicians was used to divide people and create a scientific foundation for ideas of hierarchy based on race. Awareness of this history is critical to placing discussions of race in the 21st century within an appropriate context, especially in terms of how race relates to current medical education.

Race in Medical Education

Race as a proxy in medical education today

Although far less explicit than in the 19th or 20th centuries, medical education in the 2nd decade of the 21st century continues to pathologize race. The language used in schools across the country leads many trainees to subconsciously draw false conclusions about biological differences between racial groups, neglecting the fact that race is a social construct. Certain conditions such as sickle cell disease, sarcoidosis, and cystic fibrosis are often linked to race when, in reality, race serves as a poor proxy for ancestral background and genotype. Medical education perpetuates institutionalized racism by encouraging trainees to develop heuristics that may perpetuate the very social inequities we should be working to address.

For example, in medical school we are taught that being black is a risk factor for several medical conditions. Faculty members reference epidemiological studies in the classroom that provide strong evidence for this association and then move to the next topic. In reality, the relationship between race and disease is confounded by a number of variables that are not consistently mentioned when studies that use race are discussed. For example, we have been taught that kidney function differs depending on whether someone is black or not. We are told that the most widely used equation to calculate the glomerular filtration rate for assessing kidney function uses several variables, including race, to produce a number that is used to determine kidney failure.¹³ The calculation relies on the assumption, which has no physiological evidence, that muscle mass varies by race.¹⁴ A paper from the University of Pennsylvania argues that using race to adjust metrics of renal function does not uphold scientific rigor and may potentially reduce access to kidney transplantation for racial minorities.¹⁵ Similarly, instructors reiterate summaries that ignore environmental or genetic factors when it comes to race and the increased risk of developing high blood pressure,¹⁶ glaucoma, stroke, and other conditions.

There is also a stark difference in how racial groups are sometimes discussed and depicted. During a class on ophthalmological diseases, an instructor listed “black race” as a leading risk factor for glaucoma and as a potential patient attribute that should prompt referral to specialist care. In contrast, when describing age-related macular degeneration, the instructor did not pathologize “white race” as a cause of disease. The class was instead instructed that degeneration of the macula was more commonly seen in white patients. Although subtle, there was a clear attribution of black patients to pathology. During this same lecture, the instructor went on to reinforce the false equivalence of race and genetics by telling students that genes linked to the development of certain ophthalmological diseases were “highly race dependent.”

Systemic racism is also perpetuated in our medical education through the lack of representation of individuals from minoritized groups. For example, in our experience in medical school, Latina women have been discussed in very specific circumstances: during ethical discussions on illegal immigration and as a risk factor to specific diseases, such as systemic lupus erythematosus. Examination of Native American health is often limited to discussions on diabetes mellitus type 2, hypertension, and alcohol use disorder. Yet, outside these associations of specific racial categories or ethnicities and specific health issues, constructed for students, race and ethnicity remain largely absent from our curricula. During a class discussion on important skin findings for individuals with anaphylaxis, students voiced concerns about what these findings might look like in individuals with skin tones other than the light skin tones presented. It was only after students spoke up that, in a later session, the instructor showed additional slides featuring images of this condition in other skin tones. While this example demonstrates how open discussions about our conceptions of race and its representation can lead to positive changes, it also exemplifies how subtleties can have a lasting impact on students' perception of disease and possibly on patient care.

The divide between bias training and the wider medical community

It has become commonplace in medical schools to allot some time to the subject of race and bias training. We have been introduced to the implicit association test¹⁷; we have been made aware of our own personal biases and discussed the extensive literature of bias in medicine.¹⁸ The value of this knowledge cannot be overstated, but it is important to note that this approach is a patched-together solution to a much larger problem. Outside of this dedicated time, we continue to be reminded of the associations between race and disease without unearthing the causes that may lead us to these conclusions.

However, these associations are not necessarily always defined by the pedagogy of clinicians and researchers in our classrooms but can sometimes be explained by how the wider community discusses race and disease. An example is the guidelines for colorectal cancer, which suggest African Americans be screened at 45 years of age instead of 50 as is the standard for other groups.¹⁹ Similar suggestions have been made for breast cancer screenings as a result of epidemiological and genetic studies.²⁰ A commentary on a study investigating cigarette use notes that “among U.S. smokers, 88% of African Americans use menthol cigarettes compared with 26% of whites, a phenomenon largely attributed to marketing practices targeting black communities.”²¹ The main finding from the original study is the identification of a gene variant that may increase the odds of smoking menthol cigarettes: “The variant haplotype is found only in populations of African ancestry. . . .”²² While this study attributed the genetic variant to African ancestry and not race, all too often similar findings are summarized in a way that oversimplifies and does not recognize how race itself may play a role in influencing outcomes when it is entangled with genetics or ancestry.

For instance, are the observed genetic differences in this study of cigarette use possibly due to the marketing practices of tobacco companies? Are social inequalities responsible? Rather, these results are often condensed in a way that implies African Americans have genetic variations that correlate with inherent racial differences. These seeming correlations between race and genetics are even more problematic given that the definition of race varies widely and is often a self-identified characteristic in scientific studies.²³ In light of the entanglement of this critical, but poorly defined term—race—with genetics, students may find it difficult during clinical practice to continually recognize but not promote the bias that may be present in current research.

Ultimately, bias training provides limited benefit if students are regularly encouraged to put in

practice the very same biases—through clinical reasoning and other aspects of patient care—that they have been warned against.

Rewarding bias

Among the most concerning practices is the use of race as a heuristic in medical education, which encourages physicians-in-training to adopt shortcuts in diagnosis and in other aspects of clinical care that could harm patients. These cognitive shortcuts are so embedded in medical education that even the United States Medical Licensing Examination relies on making assumptions and classifying conditions as more or less likely depending on the race presented in a vignette.²⁴ Students are frequently rewarded for recognizing race in questions on this exam as a clue for determining the “best” diagnosis without needing to pay attention to other details. Completing hundreds, even thousands, of practice questions inculcates these patterns, thus encouraging students to rely on racial assumptions. These exam-prep habits can then extend into clinical practice, resulting in a delayed diagnosis or selection of an incorrect treatment plan that may cause more detriment than benefit.

Implications of perpetuated implicit bias

A rich medical literature provides ample evidence of how implicit racial bias influences individual patient outcomes. One such example is the finding in the canonical study by Schulman et al that, in a clinical vignette scenario, physicians were less likely to recommend cardiac catheterization for women and black patients presenting with chest pain.²⁵ Clinicians also address pain management differently for black patients in a wide range of settings based on perceived biological differences attributed to race.¹⁸ A recent study highlighted how this effect is true regardless of age: Children seeking care for appendicitis received differential pain management by race in the context of moderate or severe pain.²⁶ Another study exploring the

evaluation of pediatric fractures found that parents of black children with documented accidental injuries were more likely to be reported for possible child abuse even when there was no evidence of abuse.²⁷ Statements that medical students have overheard about black patients and interactions they have had with black physicians have also affected their implicit bias.²⁸ These studies indicate that although diversification of the medical community is important, it is likely only part of the solution to eliminating racial bias from diagnoses and other aspects of patient care given the lack of racial representation across medical schools and in the general physician workforce nationwide.²⁹ The effort to reduce disparities in practice for patients must include the integration of a deeper and more critical look at race in medicine throughout the medical school curriculum.

Recommendations

Comprehensive reform in medical education and the medical school admissions process is necessary to actively recognize and dismantle the remnants of our inherited racist system, which contributes to continued mistreatment of people of color in the United States. This change will require substantive, interdisciplinary conversations about the social accountability of medicine in the past and present with many interlocutors, including ethicists, historians, sociologists, public health researchers, anthropologists, and evolutionary geneticists.^{30,31} Below we outline several recommendations intended to guide these efforts.

Probing applicants' awareness of race, health, and disease during the admissions process

The depth in which these subjects are discussed in medical curricula across the country may vary widely. As such, we believe it is important that medical school admissions committees recognize the value of composing a student body that is conscious of the potential role race has on health, disease, and illness. Applications could be more explicitly used to assess previous academic or

personal experiences that may have made an applicant more aware of the subject of race as a social construct and what this construct means for health inequity. Interviewers could be encouraged to discuss the topic with candidates to get an idea of the applicant's understanding of the relationship of race and health or social inequities. Giving these characteristics more weight as part of the "holistic review" process could produce not only a more insightful student body but also a more perceptive group of physicians who will be better prepared to tackle the issues that plague our society.

Initiating nuanced conversations about race and genetics

Education on the meaning and history of race in the United States is imperative to adequately prepare students to understand the significance of the term and its relationship to disease.

Because we live in a world where race is constantly being redefined, it is vital that physicians learn the distinction between race as constructed historically and ancestry as defined by genetics. This critical teaching should begin early in the medical school curriculum. While we recognize that medical school curricula often do not have sufficient time to grapple with the complex and heavy history of racism in medicine, we encourage curriculum designers to incorporate historical examples in lectures on a variety of topics, such as ethics, public health, research study design, and genetics. Elective courses could be created that delve into these issues further. Students should be encouraged to question the true relationship between race and disease in addition to being given the tools to further investigate claims made in didactic and clinical settings. In this way, students contribute to myth busting while gaining an appreciation for the limitations of attributing risk to an identity (e.g., race, gender). An appropriate time to include this information might be during the early, basic science content on the principles of genetics. To address the challenges in adding new material to a crowded curriculum, designers of one pilot program at the

University of Washington provided incoming medical students reading material on the topic of race in medicine the summer before courses began.

Addressing the medical curriculum

Medical students must be encouraged to actively identify the inappropriate use of race in lectures and assignments, which can be gradually revised for subsequent years. Medical school professors should be notified that they must be intentional when including race as a risk factor for disease and that they must include relevant literature to support these assertions.³² Racism, and its systemic presentation, may be substituted as a possible explanation for some observed disparities among vulnerable populations when relevant and appropriate. A perspective in the April 2019 issue of *Academic Medicine* provides concrete ways that curriculum designers can ensure that clinical vignettes used in class activities or examinations do not perpetuate bias.³³

Moving toward a cultural shift in medicine

Medical institutions must continue to foster a culture of humility in which the voices of patients, students, staff, and faculty of color are acknowledged and consistently incorporated into institutional policies and practices. Efforts that increase the recruitment of people of color both through admissions and pipeline programs are a critical part of this endeavor.³⁴ Students who are encouraged to actively engage with these topics may be more likely to question existing policies and to act to improve the health of all their patients. Above all, what is needed is a cultural shift at teaching hospitals and medical schools across the nation to eliminate the widespread and incorrect use of race that upholds the status quo of institutionalized racism and promotes poor health outcomes for people of color in the United States and other countries. Getting the portrayal of race right in medical education is a vital step in developing students into thoughtful physicians. To do so, instructors must help medical students recognize when it is appropriate to

use race in discussing disease and train them to be cautious and deliberate when doing so to avoid misleading both patients and clinicians or misconceiving a potential diagnosis or treatment. With this insight, physicians will be able to foster a critical mind-set to ensure the best treatment for all individuals in our society.

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References

1. Akee R, Jones MR, Porter SR. Race matters: Income Shares, income inequality, and income mobility for all U.S. races. *Demography*. 2019;56:999–102.
2. Roberts DE. *Fatal invention : How Science, Politics, and Big Business Re-create Race in the Twenty-First Century*. New York, NY: New Press; 2011.
3. *Encyclopedia of African American history, 1896 to the Present: From the Age of Segregation to the Twenty-First Century*. New York, NY: Oxford University Press; 2009.
4. Gates HL. *Stony the Road: Reconstruction, White Supremacy, and the Rise of Jim Crow*. New York, NY: Penguin Press; 2019.
5. Baker LD. *From Savage to Negro: Anthropology and the Construction of Race, 1896-1954*. Berkeley and Los Angeles, CA: University of California Press; 1998.
6. *The American Phrenological Journal and Miscellany, Vol 2*. Edinburgh, Scotland: Oliver & Boyd; 1825.
7. Cartwright S. Report on the diseases and physical peculiarities of the Negro race. *New Orleans Med Surg J*. 1851;8:28-37.
8. Nott JC, Gliddon GR. *Types of Mankind: or, Ethnological Researches, Based on the Ancient Monuments, Paintings, Sculptures, and Crania of Races*. Philadelphia, PA: J.B. Lippincott, Grambo & Co; 1854.
9. Pernick MS. Eugenics and public health in American history. *Am J Public Health*. 1997;87:1767–72.
10. Cohen AS. Harvard's Eugenics era. *Harvard Magazine*. 2016;March-April.

11. Lombardo PA, Dorr GM. Eugenics, medical education, and the public health service: Another perspective on the Tuskegee syphilis experiment. *Bull Hist Med.* 2006;80:291–316.
12. Lombardo PA. Medicine, eugenics, and the Supreme Court: From coercive sterilization to reproductive freedom. *J Contemp Health Law Policy.* 1996;13:1–25.
13. Delanaye P, Mariat C. The applicability of eGFR equations to different populations. *Nat Rev Nephrol.* 2013;9:513–522.
14. National Kidney Foundation. Frequently asked questions about GFR estimates. https://www.kidney.org/sites/default/files/12-10-4004_FAQ-ABE.pdf. Published 2014. Accessed October 28, 2019.
15. Eneanya ND, Yang W, Reese PP. Reconsidering the consequences of using race to estimate kidney function. *JAMA.* 2019;322:113.
16. Taylor AL, Ziesche S, Yancy C, Carson P, et al. Combination of isosorbide dinitrate and hydralazine in blacks with heart failure. *N Engl J Med.* 2004;351:2049–2057.
17. Greenwald AG, McGhee DE, Schwartz JL. Measuring individual differences in implicit cognition: The implicit association test. *J Pers Soc Psychol.* 1998;74:1464–80.
18. Hoffman KM, Trawalter S, Axt JR, Oliver MN. Racial bias in pain assessment and treatment recommendations, and false beliefs about biological differences between blacks and whites. *Proc Natl Acad Sci* 2016;113:4296–301.
19. Gupta N, Kupfer SS, Davis AM. Colorectal cancer screening. *JAMA.* 2019;321:2022.
20. Huo D, Hu H, Rhie SK, et al. Comparison of breast cancer molecular features and survival by African and European ancestry in The Cancer Genome Atlas. *JAMA Oncol.* 2017;3:1654.

21. Abbasi J. Gene variant associated with menthol cigarette smoking in some African Americans. *JAMA*. 2019;321(24):2391-2392.
22. Kozlitina J, Risso D, Lansu K, et al. An African-specific haplotype in *MRGPRX4* is associated with menthol cigarette smoking. *PLoS Genet*. 2019;15(2).
23. Mersha TB, Abebe T. Self-reported race/ethnicity in the age of genomic research: Its potential impact on understanding health disparities. *Hum Genomics*. 2015;9:1.
24. Ripp K, Braun L. Race/ethnicity in medical education: An analysis of a question bank for step 1 of the United States Medical Licensing Examination. *Teach. Learn. Med*. 2017;29:115–122.
25. Schulman KA, Berlin JA, Harless W, Kerner JF, et al. The effect of race and sex on physicians' recommendations for cardiac catheterization. *N Engl J Med*. 1999;340:618–626.
26. Goyal MK, Kuppermann N, Cleary SD, Teach SJ, Chamberlain JM. Racial disparities in pain management of children with appendicitis in emergency departments. *JAMA Pediatr*. 2015;169:996.
27. Lane WG, Rubin DM, Monteith R, Christian CW. Racial differences in the evaluation of pediatric fractures for physical abuse. *JAMA*. 2002;288:1603.
28. van Ryn M, Hardeman R, Phelan SM, Burgess DJ, et al. Medical school experiences associated with change in implicit racial bias among 3547 students: A medical student CHANGES study report. *J Gen Intern Med*. 2015;30:1748–1756.
29. Lett LA, Murdock HM, Orji WU, Aysola J, Sebro R. Trends in racial/ethnic representation among US medical students. *JAMA Netw Open*. 2019;2:e1910490.

30. Woollard RF. Caring for a common future: Medical schools' social accountability. *Med Educ.* 2006;40:301–313.
31. Bolnick DA. Combating racial health disparities through medical education: The need for anthropological and genetic perspectives in medical training. *Hum Biol.* 2015;87:361.
32. Tsai J, Ucik L, Baldwin N, Hasslinger C, George P. Race matters? Examining and rethinking race portrayal in preclinical medical education. *Acad Med.* 2016;91:916–20.
33. Krishnan A, Rabinowitz M, Ziminsky A, Scott SM, Chretien KC. Addressing race, culture, and structural inequality in medical education. *Acad Med.* 2019;94:550–555.
34. Talamantes E, Henderson MC, Fancher TL, Mullan F. Closing the gap—Making medical school admissions more equitable. *N Engl J Med.* 2019;380:803–805.