

Unconscious Bias

Addressing the Hidden Impact on Surgical Education



Leah M. Backhus, MD, MPH^{a,*}, Natalie S. Lui, MD, MAS^a,
David T. Cooke, MD^b, Errol L. Bush, MD^c,
Zachary Enumah, MD^c, Robert Higgins, MD, MSHA^c

KEYWORDS

• Unconscious bias • Implicit bias • Hidden brain • Disparities • Bias training

KEY POINTS

- Unconscious biases serve as mental shortcuts to allow us to make efficient decisions, which is valuable to the cardiothoracic surgeon.
- Unconscious bias is ubiquitous and affects all aspects of cardiothoracic surgery education from medical student applicants, to resident trainees, and the faculty who teach them.
- Unconscious bias has several unintended negative consequences that influence trainee selection, how we teach trainees, and what we teach them in patient interactions.
- The Implicit Association Test is one tool that can help identify unconscious biases that has been widely studied.
- Individuals must acknowledge the presence of unconscious biases and their effects, whereas institutions must provide a framework for culture change and capitalize on many of the training resources available to create a diverse academic environment.

INTRODUCTION

Unconscious (or implicit) biases are learned stereotypes that are automatic, unintentional, deeply engrained, universal, and able to influence behavior.¹ We are all subject to unconscious bias (UB). It is ubiquitous with deep evolutionary roots reinforced by lived experiences and social determinants. These attitudes lie outside of our awareness and extend beyond race and ethnicity. Some characteristics often subject to UB include sexual orientation groups, gender, weight, age, social class, and even height. Why then have we

evolved to rely on and reinforce biases for important decisions rather than sound empirical data? The reality is that our biases help expedite decision making and often even work to our advantage. By definition, UB lives within our unconscious or the “hidden brain.” The hidden brain has evolved to be highly efficient and, in many instances, sacrifices sophistication for the sake of speed. As an example, by 3 months of age, human infants demonstrate a strong bias toward human faces.² From an evolutionary standpoint, one can appreciate the potential protective benefits of such a bias. The precise reasons for this bias in

Disclosure Statement: The authors have nothing to disclose.

^a Stanford University, 300 Pasteur Drive, Falk Research Building, Stanford, CA 94304, USA; ^b UC Davis Health, 2335 Stockton Blvd, Suite 6121, North Addition Office Building, Sacramento, CA 95817, USA; ^c Johns Hopkins University School of Medicine, Johns Hopkins University, 720 Rutland Avenue, Ross 759, Baltimore, MD 21205, USA

* Corresponding author. Department of Cardiothoracic Surgery, Stanford University, 300 Pasteur Drive, Falk Research Building, Stanford, CA 94304.

E-mail address: lbackhus@stanford.edu

Thorac Surg Clin 29 (2019) 259–267

<https://doi.org/10.1016/j.thorsurg.2019.03.004>

1547-4127/19/Published by Elsevier Inc.

infants remain unclear. One hypothesis is that we as humans have adapted to favor “things” that are “like” us. Problems arise, however, when our UB influence our decisions in the absence of affirming data rendering them at best inaccurate and at worst, harmful.

The discipline of medicine is no exception to the influence of UB. Several studies have documented the effects of provider biases on patient care and outcomes. “[Assumptions] can narrow the options a physician gives the... patients and this limits a patient’s opportunity to make a well-informed decision,” (Laura Castillo-Page, PhD, Association of American Medical Colleges [AAMC] senior director for diversity policy and programs). But the implications of UB in medicine extend beyond that of the individual patient. They include issues regarding graduate and undergraduate medical education and the pipeline of trainees entering into the academic medical faculty. This article provides a framework for exploring the implications for UB in surgical education and highlight best practices toward minimizing its impact.

A great deal of medical education comes in the form of pattern recognition. A patient who is a certain age and presents with a certain symptom set triggers a well-defined differential diagnosis and anticipated work-up and treatment. Stereotypes of diseases are one of the cornerstones of medical education and allow us to acquire and synthesize a large volume of information and expeditiously arrive at a diagnosis and treatment plan. In the realm of cardiothoracic surgery, we are often working under time pressure that requires all of the previously mentioned processes to occur in a compressed timeframe with immediate consequences. The intensity of a cardiothoracic operation demands efficiency in decision making, which is often based on prior experience and anticipation. These are extremely beneficial to the cardiothoracic surgeon.

Furthermore, the surgeon in training must progress through defined stages of technical skill acquisition. In moving from novice to master, the surgeon relies on their ability to hard-wire technical steps and decision making into their work. Successfully anticipating challenges during the conduct of an operation requires the surgeon to use stereotyped pattern recognition while safely addressing technical challenges and the use of muscle memory. Both of these allow the expert surgeon to be safe and efficient. Stereotypes are ingrained as mental shortcuts that are valuable to our work and the way we teach it to our trainees.

The dilemma is, that in teaching medicine and surgery, we instill thinking processes and manual tasks with repetition such that they become rote.

We want to capitalize on the ability of the brain to automate complex functions so that we are quicker and more efficient at doing our work. We teach pattern recognition as a short cut and repetition as a means of quality control. Yet, these same behaviors are rooted in making rapid assumptions and when those assumptions become embedded in our subconscious, they are indeed biases by definition. Thus, not all UB are harmful. Our biases cross the line and become counterproductive when (1) they perpetuate or validate existing disparities in our world and more acutely in cardiothoracic surgery, (2) they affect how we teach, or (3) they affect what we teach. How then to harness the benefits of unconscious thinking, yet consciously reflect on our behavior and root out the negative UB that can undermine our best efforts? First, we must identify the problem. What are the UBs that are counterproductive to our mission?

DEFINING THE PROBLEM: IMPACT OF UNCONSCIOUS BIAS ON SURGICAL EDUCATION

The Surgical Education Pipeline

Addressing the role that UB plays at every level is paramount in recruiting and training the next generation of surgical leaders. Diversity of appearance breeds diversity in experience. Yet, the current medical landscape still has improvements to make along the pipeline to creating a more diverse surgical workforce. Women and minorities have long been underrepresented in medicine, especially in cardiothoracic surgery. Currently, women comprise about 48% of medical school students, 41% of general surgery residents, and 20% of cardiothoracic surgery residents.³ In 2014 to 2015, African Americans represented 12.4% of the United States population, 5.7% of medical students, and 6.2% of general surgery residents.⁴ In the same years, Hispanics represented 17.4% of the United States population, 4.5% of medical students, and 8.5% of general surgery residents.⁴ It is important that we study how UB affects graduate and undergraduate medical education and for many, the point of entry into the educational pipeline is medical school admissions.

Implications for Undergraduate and Medical Education

Given the shift in many cardiothoracic training programs toward the integrated 6-year training format, undergraduate education has garnered increasing importance in feeding the cardiothoracic surgery workforce. Studies have demonstrated that UB plays a significant role in

recruiting and practice across disciplines and fields including criminal justice, education, and health care but precise measurement is challenging.^{5–7} One measure of UB that has been studied extensively is the Implicit Association Test (IAT) developed by social psychologists. The IAT is a computer-based tool that requires subjects to quickly categorize two target concepts with an attribute (eg, the concepts “male” and “female” with the attribute “logical”), such that easier pairings generate quicker response times and are interpreted as more strongly associated in memory thus more congruent with biases.⁸ Strong gender and race preferences are often revealed by those who take the test. In a study conducted at the Ohio State University, 140 members of the medical school admissions committee took the black–white IAT. Researchers found that all groups (men, women, students, and faculty) displayed significant levels of implicit white preference, with males and faculty demonstrating the largest bias measures. The benefit of the test was that 67% of survey respondents believed that knowing their IAT results might be helpful in reducing bias in medical school admissions.⁹ The IAT is not universally accepted as the gold standard for assessing UB with some pointing out low reproducibility and difficulty in interpretation. Nonetheless it remains the most validated instrument available and still likely has utility in identifying and targeting biases.

The effects of UB on undergraduate medical education also has the potential to influence student specialty choice. van Ryn and coworkers¹⁰ explored this issue among medical students at the Mayo Clinic College of Medicine and found that when medical students are exposed to negative comments from attending physicians, their own negative implicit attitudes can worsen. Negative biases from faculty can also influence the way students are taught to treat and interact with patients. A study of first-year medical students at Johns Hopkins noted results from an IAT measuring weight bias, and demonstrated that 70% of students held a “thin” preference. Perhaps more concerning, however, were the biases held by students who believed that obesity was the result of ignorance (74%) and laziness (28%).¹¹ The influence of UB on medical care has also been well documented. The Institute of Medicine report, *Unequal Treatment* published in 2002, detailed significant variation in the rates of medical procedures by race, even when insurance status, income, age, and severity of conditions are comparable.¹² It includes disparities in diagnosis and treatment of conditions ranging from acute coronary syndromes, rates of limb amputation among

patients with diabetes, addressing postoperative or acute pain, and delivery of cancer care services. The underpinnings of these disparities may lie in UBs that are transferred to impressionable trainees.

Implications for Graduate Medical Education

Almost assuredly the same biases affecting medical school admissions are mirrored at the level of resident selection, but there may be other nuanced differences for the cardiothoracic surgical resident. A study of medical student applicants seeking cardiothoracic surgery residency positions demonstrated that despite being academically successful, many students experience significant negativity regarding their applications depending on whether they are applying to both general surgery and cardiothoracic surgery versus integrated thoracic residency programs alone. This bias can originate from either the general surgery or thoracic surgery faculty and is not lost on the applicant.¹³ Another potential bias is in the form of geographic preference. Although some applicants may feel more “welcome” at their home institution, the reverse can also be felt. One study quantified the effect of “homefield advantage” in that one-quarter of categorical general surgery slots were filled with “home program” graduates. Such a preference is intuitive, but does nothing to advance a diverse experiential educational environment critical for learning.¹⁴

Many studies have focused on better understanding the presence and implications for UB in surgical residency with regards to gender (**Box 1**).^{15,16} In 1996, Dresler and colleagues¹⁷ published their results of a survey mailed to all women and a cohort of men certified by the American Board of Thoracic Surgery. Women reported significantly more discrimination during their cardiothoracic residency training. The sources of discrimination were female and male attendings, female and male resident colleagues, nurses, staff, and patients or families. Women were also significantly more likely to believe that gender

Box 1 **Examples of biased comments**

- “She’s too nice to be a cardiac surgeon.”
- “She’s technically very good. She operates like a man!”
- “Women should consider other surgical subspecialties instead of cardiothoracic surgery, since the lifestyle is better.”
- “This needle is way too small – it’s for girls!”

bias had hindered their career. More recently, Bruce and colleagues¹⁸ surveyed members of the Association of Women Surgeons. Of 334 female medical students, residents, and practicing physicians, 87% experienced gender-based discrimination in medical school, 88% in residency, and 91% in practice. Myers and colleagues¹⁹ interviewed general surgery residents in an academic center. They found that female residents were less likely to self-identify as a “surgeon” (11% vs 38%; $P < .001$) and believed their professional role was disregarded more often by patients and physicians.

Surveys have also addressed race-based discrimination and inequities in surgical training. Wong and colleagues²⁰ reviewed survey results from general surgery residents taking the 2008 American Board of Surgery In-Training Examination. African American and Asian residents were less likely to believe that they fit in at their programs compared with white residents (73.9% vs 83.3% vs 86.2%). African American residents were less likely to believe they could count on their peers for help (85.2% vs 77.2%). Although these results may not seem to influence resident training at first glance, they are integral to supporting physician well-being and add to other microaggressions experienced disproportionately by these groups. Importantly, they contribute to physician burnout and attrition at every level.

Evaluating evaluations

Gender bias has also been studied in reviewing resident evaluations. Dayal and colleagues²¹ studied resident milestone evaluations by faculty at several emergency medicine residency programs. They found that female and male residents had similar milestone levels initially, but male residents had a 12.7% higher rate of milestone attainment through the 3-year program. By the last year of training, male residents were rated higher than female residents for all 23 subcompetencies. There was no difference in evaluations between female and male faculty.

Mueller and colleagues²² expanded on the previous study by reviewing the qualitative assessments of residents. They found that male residents with poor evaluations received consistent feedback from different faculty, whereas female residents with poor evaluations received inconsistent feedback. In addition, this inconsistent feedback often involved issues of autonomy and assertiveness. In contrast to these qualitative assessments, bias was not apparent in quantitative assessments of the same residents underscoring the need for more objectivity and standardization in resident evaluations.^{15,23}

Operative autonomy

Teaching the technical conduct of an operation is a complex interplay between resident and attending surgeon and is difficult to objectively measure. One measure that has been studied is that of operative autonomy and research examining gender bias in this area has been mixed. Meyerson and colleagues²⁴ studied thoracic surgery residents and faculty who evaluated intraoperative autonomy using the four-point Zwisch scale. Faculty reported that female residents had less autonomy than male residents (30% vs 37%) and female residents reported lower autonomy compared with male residents (19% vs 33% with meaningful autonomy). In contrast, Thompson-Burdine and colleagues²⁵ examined faculty entrustment and resident entrustability scores across several surgical specialties using the OpTrust scoring system. They found that resident sex was not associated with faculty entrustment in the operating room. Among recent female graduates of cardiothoracic training programs, women were equally satisfied with their career choice, had similar numbers of interviews and job offers, and felt equally prepared for their boards. However, they felt less prepared technically and less ready for independent practice, highlighting a deficit in our training techniques or a failure to instill confidence where it is appropriate. Either explanation represents room for improvement.²⁶

Implications for Surgical Faculty

One of the most critical elements to diversify the workforce is to have supportive faculty and leadership, who have a diversity of ideas and backgrounds. Thus, lack of diversity in cardiothoracic surgery at the faculty and administrative levels has untoward effects on graduate medical education. There are many reasons contributing to disparities among cardiothoracic academic faculty spanning the continuum of recruitment, promotion, and tenure. Although much attention has been given toward early stage medical trainees, comparatively less effort and has been devoted to the ranks of the surgical faculty.

Faculty recruitment and retention

There are several negative consequences for lack of cultural diversity among faculty affecting the institution, its individuals, and the overall clinical and educational mission. The problem is fueled by high attrition rates with loss of great talent when an underrepresented minority (URM) is not considered for promotion in a timely manner or leaves the institution, academia, or medicine. Retention is one of the first things that must be

addressed before change is contemplated. Rodriguez and colleagues²⁷ identified issues contributing to URM faculty attrition and highlighted lack of mentorship access, peer networks, professional skill development, and understanding of institutional culture as recurring themes. A recent longitudinal analysis of AAMC and Accreditation Council of Graduate Medical Education data since 2005 detailed this lack of diversity in surgical faculty.²⁸ The authors identified that for African Americans, at all ranks of the academic ladder, including tenure, there was either no change or a decrease in represented proportions. For Hispanic faculty, except for assistant professors where there was significant proportional decrease, all other ranks, including tenure, experienced significant increases in the represented proportions of members. These findings suggest that although diversification initiatives may be effective in producing positive change in some areas, the effects are not unanimously appreciated, and that particular additional focus may be necessary to include certain URM groups.

Once recruited, faculty are subject to the same UB that affect surgical trainees, but they also experience UB in unique ways with implications for patient care and professional advancement. In one compelling example, Files and colleagues²⁹ reviewed whether professional titles were used when introducing speakers at internal medicine grand rounds. They found that female introducers were more likely to use professional titles compared with male introducers (96% vs 66%), and male introducers were more likely to use professional titles when introducing male speakers compared with female speakers (72% vs 49%). Furthermore, female faculty may be subject to different evaluation criteria even from their surgical trainees. In a study by Fassiotto and colleagues,³⁰ female physician faculty received lower evaluations than their male counterparts across all specialties but the negative effects were most pronounced for female physicians being evaluated in specialties with low female representation. Bias may also influence the norms for evaluating surgeon competency such that referring physicians may view surgical outcomes more adversely when performed by female surgeons, reflected by a sharper decrease in subsequent referrals. This has the potential for dire consequences for surgical revenue and overall standing within departments.^{31,32} It also has the potential to affect the way a female faculty member may teach within the operating room in terms of resident surgical autonomy if she perceives heightened scrutiny.

STRATEGIES TO ADDRESS THE ISSUES

Ultimately, we would like to catalyze change within our entire specialty toward improving the quality of the surgeons we train and the quality of patient care (Box 2). Many psychology experiments that seek to change UB of individuals take an approach akin to treating UB as something like diabetes: a chronic condition that is managed, not a behavior to overcome. Approaching the issue from the standpoint of viewing all UB as “bad,” labels all those who harbor UB as “bad people.” But physicians are often seen as an egalitarian group, thus acknowledging our own biases and the way in which they may negatively impact the care of patients or teaching of residents is a difficult prospect to grapple with. This concept is called cognitive dissonance and serves as one of the potential barriers to change. By divorcing the concept of bias as indicative of maleficence, only then will individuals and institutions be successful in attempts to overcome them.

Targeted Strategies for Trainees

There are other barriers to overcoming bias that are specific to the training paradigm. First, there is a large power differential between trainees and faculty. Faculty have control over the quality of education, quality of life, subsequent training, and career opportunities of trainees. Residents play an important role in identifying and eliminating UB, yet fear of retaliation means they may not feel empowered to speak out. It is often not until their later years when they have better rapport with attending

Box 2

Strategies to address UB in surgical education

- Incorporate IAT into onboarding for faculty and trainees
- Third-party training/workshops for departments and institutions on implicit bias and its impact
- Formal mentoring programs (peer-to-peer and trainee-faculty)
- Blinded promotion practices
- Objective assessments/milestone evaluations
- Transparent, objective compensation plans
- Well-articulated institutional commitment/vision planning
- Structured and objective interview techniques for residency program
- Reporting protocols for perceived bias or discriminatory behavior

physicians that they feel comfortable reporting bias. Many times, the UB may not be obvious such that it is unclear whether bias has contributed at all. Choo³³ wrote a Twitter thread called “Is it gender bias, or do I just suck?” describing several situations in which she (or someone she knows) experienced gender bias. Because it is more subtle than overt discrimination or harassment, trainees may not think it is worth reporting. Finally, it is difficult to know how to respond to bias with no clear reporting structure.

Trainees should document biased comments or behavior, including the time, place, and quote direct statements. They should also keep any documented evidence of bias, such as emails, texts, or photos. Trainees should identify an ally to whom they can report the incident or behavior. The person could be a faculty whom the trainee trusts, the program director, or the designated ombudsperson by the training program and affiliated department of human resources. On the part of the residency program, protocols should be in place to deal with incoming complaints or concerns of unfair treatment. These should also be aligned with protocols at the institutional level for all graduate medical educational programs. Depending on the situation, the goal of reporting may vary from awareness to apology to remediation to punishment. Trainees should also build support networks, inside and outside of the residency program. Sharing stories about bias and how to respond to it helps decrease the mental toll that bias can take over time.

Teaching about UB is no easy task. Many schools have incorporated the IAT as a standard assessment for incoming medical students; however, putting the results to good use requires commitment and more than a single intervention. A study by Gonzalez and colleagues³⁴ suggests that a single session is insufficient to offer adequate instruction on UB. In their study, 22% of students surveyed actually denied the results of their IAT. When done properly, however, the results are rewarding. A follow-up study highlighted the importance of longitudinal training for a UB curriculum.³⁵ The study by Geller and Watkins¹¹ reported that up to 30% of students described improvements in their attitudes following ethics training aimed at influencing their weight-based biases. Thus, in developing UB education, a longitudinal curriculum should be emphasized as opposed to haphazard or ad hoc sessions.

Targeted Strategies for Faculty

The issues of UB among faculty are even more challenging because they must be managed and

addressed in different domains including interactions with trainees, peers, and those that may affect patient care. As academic and clinical leaders, surgical faculty are well positioned to eliminate UB in surgical education. Faculty awareness of concepts of UB can make equitable matriculation into surgical residency. In addition, as surgical leaders transition from early career to midcareer and advanced career faculty, new responsibilities include faculty mentorship, sponsorship, and coaching.

To be a successful mentor, sponsor, or academic coach, an individual does not need to look like the colleague they are helping. When midcareer and senior faculty who are not of color are to mentor, sponsor, or coach colleagues of color, or colleagues who are not of the same gender, they should understand and acknowledge that particular colleague’s professional needs. These may include professional development training, access to opportunities and networks, emotional support to manage the stressors of academic advancement, institutional sponsorship, role models whose success they want to emulate, safe spaces to discuss experiences, and honest constructive feedback.³⁶ In addition, if an individual cannot directly mentor their early career colleagues, then that individual’s professional expertise can still be of value. They can direct their diverse junior faculty colleagues to other faculty members who can fulfill their individual mentoring needs, forming a mentoring team.

Faculty are uniquely positioned to improve the resident selection process by understanding their own UB and acknowledging the multiple layers in an applicant’s journey. This includes selection for honors societies, letters of recommendation, and applicant selection. “Blind spots” in cultural awareness are counterproductive to effective faculty leadership. Santen and colleagues³⁷ queried fourth-year medical students from a single medical school after the residency match. A total of 90% of the students were asked at least one potentially discriminatory question, including questions about their marital status, about children, family planning, nationality, and religious beliefs.

A solution is to implement standardized interview questions that are germane to what the trainee may experience at the residency program, with a scoring system grading the interviews response to the questions, as opposed to a free-flowing unstructured interview.³⁸ Because few residency programs currently use structured interviews, this is an opportunity for innovation in cardiothoracic surgery education.^{39,40}

Several academic institutions are leading the way in local efforts to increase URM retention,

productivity, and promotion. A small subset have conducted prospective studies demonstrating effectiveness of their programs boasting increases in faculty retention, promotion, and representation of up to 80% to 90%.^{41,42} Similarly, interventions aimed at improving gender bias among faculty have also shown some success. The University of Wisconsin sought to address gender bias among its faculty within 92 departments or divisions using a cluster randomized control study. The experimental departments were subjected to a 2.5-hour workshop on gender bias intervention. The authors reported significantly greater changes postintervention for faculty in experimental versus control departments on several outcome measures, including self-efficacy to engage in gender-equity-promoting behaviors. When greater than or equal to 25% of a department's faculty attended the workshop, significant increases in self-reported action to promote gender equity occurred at 3 months. Postintervention, faculty in experimental departments expressed greater perceptions of fit, valuing of their research, and comfort in raising personal and professional conflicts.⁴³

Targeted Strategies for the Institution

As an institution, with the full support of leadership at all levels, a commitment to the principles of diversity and inclusion by striving to create a culture in which all students, faculty, and staff feel respected and valued is a must. Recruiting and retaining a diverse community and creating a climate of respect that is supportive of their success encourages innovation and enhances a department's ability to fulfill its core mission: inclusive excellence.

Regular programming managed by human resources personnel and/or the school of medicine serves to establish a culture of inclusion and a sense of collaboration, trust, and zero tolerance for overt bias and microaggressions. Some organizations have incorporated the IAT into various facets of training and leadership. UB is a habit that is remediated through literacy training and education to reduce discrimination. Institutions must also empower residents, faculty, and staff to report discriminatory practices without fear of retaliation or retribution. Addressing issues of UB and overt bias at the institutional level requires not only acknowledgment that these issues exist and persist in modern health care environments, but also that they undermine the academic mission of institutions.

Specific efforts to create a more inclusive and diverse health care environment starts with a

well-articulated vision by senior leadership on a regular and consistent basis (**Box 3**). This vision should clearly outline the benefits of such a program for the entire health care organization and emphasize it as a core value in the vision statement.

It is evident that if an organization is developing such a vision as a new focus or emphasis, it takes time to change a culture that otherwise has not focused on these issues previously. It is hoped this is a "proactive" emphasis, rather than a "reactive" approach to addressing ongoing concerns or issues.

Leadership development and environmental change

Leadership development in the areas of diversity and inclusion not only raises awareness about the problems of UB but also endeavors to develop leaders from the majority and underrepresented health care communities to affect change in the health care environment. In an ideal institutionally supported environment, these programs are the responsibility of the majority and the URM. Dedicated leadership development programming and instruction are necessary to enhance the change in culture of these environments. The responsibility for these diversity programs often falls to the diversity and inclusion institutional official appointed either in the school of medicine as a dean or health system vice president as the "accountable leader." In addition, many URMs are often recruited to participate in the programming related to these issues; the so called "minority tax."

It is a collective responsibility of the academic and surgical leadership and all surgical faculty in an educational program to enhance diversity and change the culture of the environment to be more inclusive. Underrepresented minority students, residents and faculty can and should serve as ambassadors for diversity. Leadership and faculty development are further advanced by systematic training at the institutional and association level. The American College of Surgeons, the

Box 3

Representative vision and goals statements

- Increase faculty, student, and staff diversity through broad recruitment, training engagement, and retention efforts
- Creation of a more inclusive academic environment by enhancing transparency and accountability for all members of the health care environment

American Heart Association, the American Association of Thoracic Surgery, the Society of Thoracic Surgeons, Women in Thoracic Surgery, the National Institutes of Health Minority Access to Research Careers program, and several other professional organizations have developed leadership programs to address diversity and inclusion. The Society of Black Academic Surgeons Leadership and Faculty Development Institute was developed in 2006 to provide intense and focused leadership training and mentorship for minority academic surgeons. These programs enhance the skill sets of future leaders through a variety of program elements focusing on mentorship, strategic planning, conflict resolution, and the value of sponsorship.

Our primary aim is to provide a framework that outlines strategies and skills that can be taught to medical trainees and practicing physicians, to prevent unconscious attitudes and stereotypes from negatively influencing the course and outcomes of clinical encounters. These strategies and skills are designed to (1) enhance internal motivation to reduce bias, while avoiding external pressure; (2) increase understanding about the psychological basis of bias; (3) enhance providers' confidence in their ability to successfully interact with socially dissimilar patients; (4) enhance emotional regulation skills; and (5) improve the ability to build partnerships with patients.^{44,45}

SUMMARY

UB is ubiquitous and affects our daily lives and work. Cardiothoracic surgery is no exception to its influence. Most often used for creating mental shortcuts, it can also influence the way in which we support and select medical students and residents for training, how and what we teach the trainee, and how we may inadvertently perpetuate disparities in care and diversity within our workforce. Once we acknowledge the presence of UB, we will be successful in implementing strategies to mitigate its negative influence. "Extraordinary people are not extraordinary because they are invulnerable to unconscious biases. They are extraordinary because they choose to do something about it" (Shankar Vedantam).⁴⁶

REFERENCES

1. Fiarman S. Unconscious bias: when good intentions aren't enough. *Disrupting Inequity* 2016; 74(3):10–5.
2. Frank MC, Vul E, Johnson SP. Development of infants' attention to faces during the first year. *Cognition* 2009;110(2):160–70.
3. Antonoff MB, David EA, Donington JS, et al. Women in thoracic surgery: 30 years of history. *Ann Thorac Surg* 2016;101(1):399–409.
4. Abelson JS, Symer MM, Yeo HL, et al. Surgical time out: our counts are still short on racial diversity in academic surgery. *Am J Surg* 2018;215(4):542–8.
5. Correll J, Park B, Judd CM, et al. Across the thin blue line: police officers and racial bias in the decision to shoot. *J Pers Soc Psychol* 2007;92(6):1006–23.
6. Green AR, Carney DR, Pallin DJ, et al. Implicit bias among physicians and its prediction of thrombolysis decisions for black and white patients. *J Gen Intern Med* 2007;22(9):1231–8.
7. Ruck MD, Tenenbaum HR, Sines J. Brief report: British adolescents' views about the rights of asylum-seeking children. *J Adolesc* 2007;30(4):687–93.
8. Greenwald AG, McGhee DE, Schwartz JL. Measuring individual differences in implicit cognition: the implicit association test. *J Pers Soc Psychol* 1998;74(6):1464–80.
9. Capers QT, Clinchot D, McDougale L, et al. Implicit racial bias in medical school admissions. *Acad Med* 2017;92(3):365–9.
10. van Ryn M, Hardeman RR, Phelan SM, et al. Psychosocial predictors of attitudes toward physician empathy in clinical encounters among 4732 1st year medical students: a report from the CHANGES study. *Patient Educ Couns* 2014;96(3):367–75.
11. Geller G, Watkins PA. Addressing medical students' negative bias toward patients with obesity through ethics education. *AMA J Ethics* 2018;20(10):E948–59.
12. Institute of Medicine Committee on U, Eliminating R, Ethnic Disparities in Health C. In: Smedley BD, Stith AY, Nelson AR, editors. *Unequal treatment: confronting racial and ethnic disparities in health care*. Washington (DC): National Academies Press (US); 2003. Copyright 2002 by the National Academy of Sciences. All rights reserved.
13. Meza JM, Rectenwald JE, Reddy RM. The bias against integrated thoracic surgery residency applicants during general surgery interviews. *Ann Thorac Surg* 2015;99(4):1206–12.
14. Falcone JL. Home-field advantage: the role of selection bias in the general surgery national residency matching program. *J Surg Educ* 2013;70(4):461–5.
15. Gerull KM, Loe M, Seiler K, et al. Assessing gender bias in qualitative evaluations of surgical residents. *Am J Surg* 2019;217(2):306–13.
16. Phillips NA, Tannan SC, Kalliainen LK. Understanding and overcoming implicit gender bias in plastic surgery. *Plast Reconstr Surg* 2016;138(5):1111–6.
17. Dresler CM, Padgett DL, MacKinnon SE, et al. Experiences of women in cardiothoracic surgery. A gender comparison. *Arch Surg* 1996;131(11):1128–34 [discussion: 1135].
18. Bruce AN, Battista A, Plankey MW, et al. Perceptions of gender-based discrimination during surgical

- training and practice. *Med Educ Online* 2015;20:25923.
19. Myers SP, Hill KA, Nicholson KJ, et al. A qualitative study of gender differences in the experiences of general surgery trainees. *J Surg Res* 2018;228:127–34.
 20. Wong RL, Sullivan MC, Yeo HL, et al. Race and surgical residency: results from a national survey of 4339 US general surgery residents. *Ann Surg* 2013;257(4):782–7.
 21. Dayal A, O'Connor DM, Qadri U, et al. Comparison of male vs female resident milestone evaluations by faculty during emergency medicine residency training. *JAMA Intern Med* 2017;177(5):651–7.
 22. Mueller AS, Jenkins TM, Osborne M, et al. Gender differences in attending physicians' feedback to residents: a qualitative analysis. *J Grad Med Educ* 2017;9(5):577–85.
 23. Salles A, Mueller CM, Cohen GL. A values affirmation intervention to improve female residents' surgical performance. *J Grad Med Educ* 2016;8(3):378–83.
 24. Meyerson SL, Sternbach JM, Zwischenberger JB, et al. The effect of gender on resident autonomy in the operating room. *J Surg Educ* 2017;74(6):e111–8.
 25. Thompson-Burdine J, Sutzko DC, Nikolian VC, et al. Impact of a resident's sex on intraoperative entrustment of surgery trainees. *Surgery* 2018;164(3):583–8.
 26. Stephens EH, Robich MP, Walters DM, et al. Gender and cardiothoracic surgery training: specialty interests, satisfaction, and career pathways. *Ann Thorac Surg* 2016;102(1):200–6.
 27. Rodriguez JE, Campbell KM, Fogarty JP, et al. Underrepresented minority faculty in academic medicine: a systematic review of URM faculty development. *Fam Med* 2014;46(2):100–4.
 28. Abelson JS, Wong NZ, Symer M, et al. Racial and ethnic disparities in promotion and retention of academic surgeons. *Am J Surg* 2018;216(4):678–82.
 29. Files JA, Mayer AP, Ko MG, et al. Speaker introductions at internal medicine grand rounds: forms of address reveal gender bias. *J Womens Health (Larchmt)* 2017;26(5):413–9.
 30. Fassiotto M, Li J, Maldonado Y, et al. Female surgeons as counter stereotype: the impact of gender perceptions on trainee evaluations of physician faculty. *J Surg Educ* 2018;75(5):1140–8.
 31. Sarsons H. Interpreting signals in the labor market: evidence from medical referrals [Job Market Paper]. In.
 32. Osseo-Asare A, Balasuriya L, Huot SJ, et al. Minority resident physicians' views on the role of race/ethnicity in their training experiences in the workplace. *JAMA Netw Open* 2018;1(5):e182723.
 33. Choo E. Is it gender bias, or do I just suck?. 2018. Available at: https://twitter.com/choo_ek. Accessed March 1, 2018.
 34. Gonzalez CM, Kim MY, Marantz PR. Implicit bias and its relation to health disparities: a teaching program and survey of medical students. *Teach Learn Med* 2014;26(1):64–71.
 35. Gonzalez CM, Garba RJ, Liguori A, et al. How to make or break implicit bias instruction: implications for curriculum development. *Acad Med* 2018;93:S74–81 (11S Association of American Medical Colleges Learn Serve Lead: Proceedings of the 57th Annual Research in Medical Education Sessions).
 36. KA R. Can I mentor African-American faculty? 2016. Available at: <https://www.insidehighered.com/advice/2016/02/17/advice-white-professor-about-mentoring-scholars-color-essay>. Accessed November 24, 2018.
 37. Santen SA, Davis KR, Brady DW, et al. Potentially discriminatory questions during residency interviews: frequency and effects on residents' ranking of programs in the national resident matching program. *J Grad Med Educ* 2010;2(3):336–40.
 38. Huffcutt AI. From science to practice: seven principles for conducting employment interviews. *Appl H R M Res* 2010;12(1):121–36.
 39. Kim RH, Gilbert T, Suh S, et al. General surgery residency interviews: are we following best practices? *Am J Surg* 2016;211(2):476–81.e3.
 40. Whitgob EE, Blankenburg RL, Bogetz AL. The discriminatory patient and family: strategies to address discrimination towards trainees. *Acad Med* 2016;91:S64–9 (11 Association of American Medical Colleges Learn Serve Lead: Proceedings of the 55th Annual research in medical education sessions).
 41. Wingard D, Trejo J, Gudea M, et al. Faculty equity, diversity, culture and climate change in academic medicine: a longitudinal study. *J Natl Med Assoc* 2019;111(1):46–53.
 42. Deas D, Pisano ED, Mainous AG, et al. Improving diversity through strategic planning: a 10-year (2002-2012) experience at the Medical University of South Carolina. *Acad Med* 2012;87(11):1548–55.
 43. Carnes M, Devine PG, Baier Manwell L, et al. The effect of an intervention to break the gender bias habit for faculty at one institution: a cluster randomized, controlled trial. *Acad Med* 2015;90(2):221–30.
 44. Burgess D, van Ryn M, Dovidio J, et al. Reducing racial bias among health care providers: lessons from social-cognitive psychology. *J Gen Intern Med* 2007;22(6):882–7.
 45. Glicksman E. Unconscious bias in academic medicine: overcoming the prejudices we don't know we have [press release]. AAMC2016.
 46. Vedantam S. *The hidden brain: how our unconscious minds elect presidents, control markets, wage wars, and save our lives*. 1st edition. New York: Spiegel & Grau; 2010.