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Embracing differences to improve success: American Orthopaedic Association presidential address, Boston, Massachusetts, June 23, 2017: AOA critical issues

Regis J O'Keefe
Washington University School of Medicine in St. Louis

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AOA Critical Issues

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Regis J. O'Keefe, MD, PhD

It is a distinct pleasure to be installed as the President of the American Orthopaedic Association (AOA) and to address such a distinguished organization. The AOA has an extraordinary tradition of leadership. Since its inception, it has identified critical needs for our profession and implemented strategies to advance the science and art of orthopaedic surgery. We are currently at a critical juncture—the increasing need for diversity in our professional ranks. In this presentation/essay, I will embrace the importance of diversity through a series of questions.

Why Should We Embrace Diversity?

The rationale for diversity is compelling. Groups with diverse membership are more effective at identifying and solving problems. Both individuals and organizations perform at higher levels and attain more success when they embrace diversity.

Numerous scientific studies report the advantages of decision-making by diverse groups. In one study, Levine et al. examined the ability of financial traders to accurately respond to market swings and detect price bubbles[1]. Bubbles emerge when traders err collectively in pricing, causing a misfit between market prices and the true values of assets. Their study, published in the prestigious *Proceedings of the National Academy of Sciences of the United States of America*, showed that market prices fit true values 58% better in ethnically diverse markets compared with ethnically homogeneous markets. They concluded that diversity results in differences of opinion that enhance deliberation, upend conformity, and result in improved decision-making. Their findings were further highlighted in a *New York Times* editorial and make a strong statement for the benefits of diverse groups[2].

Nature also provides a compelling example. Three different bird species—Carolina chickadees (*Poecile carolinensis*), tufted titmice (*Baeolophus bicolor*), and white-breasted nuthatches (*Sitta carolinensis*)—live either alone or in mixed flocks. Experiments examining the success of these species showed that in mixed flocks with a ratio of 1:1:1, each of the species was more successful in finding food sources. In single-species flocks, the species tended to have limited geographical range, but in mixed flocks, the birds had higher levels of exploration and exposure to more potential food sources[3].

What Are the U.S. Demographics, and Does the Physician Workforce Generally Mimic the U.S. Population?

The United States is undergoing profound demographic change with increasing diversity of the population. This was evident in the age-related demographic makeup of the U.S. population in

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the 2010 United States Census, which is the basis of long-term U.S. Census Bureau projections that were published in 2014[4]. It is now anticipated that in 2018, whites will compose <50% of the population under the age of 18 years, and, by 2060, less than half of the total U.S. population will be white[4].

The American Association of Medical Colleges (AAMC) closely follows the demographics of the U.S. physician population. The AAMC defines underrepresentation in medicine as a relatively lower number of physicians from specific racial and ethnic populations compared with their numbers in the general population. Despite efforts by multiple groups, including the government, the AAMC, foundations, and medical schools, the number of African American/black, American Indian/Alaska Native, and Latino/Hispanic applicants and matriculants to U.S. medical schools is insufficient. Their relative percentage of medical school matriculation has had limited growth, or in the case of the Latino/Hispanic population, has fallen between 1980 and 2016 (Table I) compared with their population growth over that time[5]. Altogether, underrepresented minority (URM) students represented 11.3% of the entering medical school class in 1980 compared with 13.7% in 2016[5].

Multiple factors create barriers for URMs. There is a lack of URM role models; the AAMC reports that only 2% of male full-time faculty at MD-granting institutions are black. A recent publication indicates that African American medical students finish medical school with more debt than whites and other groups[6]. The AAMC also reports that black graduates of U.S. medical schools finish with disproportionately high debt compared with all graduates. Moreover, socioeconomic status is an independent predictor of success in the medical school admissions process. A recent article published in *Academic Medicine* assessed the socioeconomic status of applicants and their relative success in the admissions process[7]. The authors defined 5 levels of socioeconomic status ranging from EO (education and occupation)-1 (students whose parents had less than a bachelor's degree) to EO-5 (students whose parents had a doctoral or professional degree). One-half of the medical school applicants came from the EO-1 (23%) and the EO-5 (27%) groups in 2012. However, there were startling differences in the matriculation rate. Between 1987 and 2005, 48% to 51% of U.S. medical students came from the most privileged backgrounds (EO-5), compared with only a 5.5% matriculation rate for applicants from the most disadvantaged backgrounds (EO-1)[7].

Another concern is that career development can be stagnated for URMs and women. This is evident in data compiled by the AAMC concerning the progress of women in academic medicine. As of 2014, although 47% of U.S. medical students were women, there are progressively fewer women in more senior positions, with women representing 38% of full-time faculty but only 22% of professors and 16% of medical school deans[8].

Do Minority Populations Face Unique Health Challenges, and Does the Lack of Physician Diversity Impact the Health of the U.S. Population?

In the Sullivan Commission report, Louis W. Sullivan, MD, former U.S. Secretary of Health and Human Services and President Emeritus of Morehouse School of Medicine, wrote "The fact that the nation's health professions have not kept pace with changing demographics may be an even greater cause of disparities in health access and outcomes than the persistent lack of health insurance for tens of millions of Americans." The commission report further stated that "Schools of medicine, dentistry, and nursing have been among the last to integrate their class-rooms, and their professional organizations have been equally slow in recruiting minorities into their ranks."[9]

A landmark article in *The New England Journal of Medicine* in 1996 found that communities with a high proportion of URMs were four times more likely to have a shortage of physicians, regardless of community income[10]. This study also examined the patient populations of minority and nonminority physicians in various California communities, and found that while 50% of the patients of African American physicians were black, <10% of non-African American physicians' patients were black. Furthermore, African American and Hispanic physicians care for more patients with Medicaid and without insurance than other physicians[10].

TABLE I Number and Percentage of U.S. Medical School Matriculants in 1980 and 2016 by Race or Ethnicity

Race or Ethnicity	1980		2016	
	Number	Percent	Number	Percent
American Indian or Alaska Native	63	0.4%	54	0.3%
Asian	679	4.0%	4,475	21.3%
Black or African American	999	6.0%	1,497	7.1%
Hispanic or Latino	807	4.9%	1,335	6.3%
White	13,884	83.7%	10,828	51.5%
Total	16,587*		21,030†	

*Total includes 757 (2.1% of applicants) unknown and non-U.S. citizens and nonpermanent residents not included in the analysis. †Total includes 8,821 (16.6% of applicants) Native Hawaiian or other Pacific Islander, multiple race, other, unknown, and non-U.S. citizens and nonpermanent residents not included in the analysis. (Source: AAMC Data Warehouse Applicant Matriculant File as of August 22, 2017. Reproduced, with permission of the Association of American Medical Colleges, from: Acosta DA, Poll-Hunter NI, Eliason J. Trends and racial and ethnic minority applicants and matriculants to U.S. medical schools, 1980-2016. Analysis in Brief 2017 Nov;17[3]:1-4[5].)

A more recent 2014 publication in *JAMA Internal Medicine* confirmed the earlier findings. The authors showed that nonwhite physicians cared for 53.5% of minority and 70.4% of non-English-speaking patients. Patients from underserved groups were significantly more likely to see nonwhite physicians than white physicians, and patients of black, Hispanic, and Asian physicians were more likely to have Medicaid[11].

An additional issue concerns the observation that URM groups do not have appropriate representation in clinical trials and scientific investigations. The absence of these groups in clinical trials potentially compromises their ability to share in medical advances. It also fails to account for the potential of unique genetic variants in URMs to alter the course of a medical disease or its response to treatment[12]. Somerson et al. recently reviewed orthopaedic clinical trials that were published between 2008 and 2011; they found that the inclusion of subjects from the Hispanic and African American populations was 3.5-fold and twofold lower than their proportion in the U.S. population[13].

How Successful Is Orthopaedics in Embracing Diversity?

Orthopaedic organizations have confronted the challenge of a lack of diversity for several decades. Augustus A. White, MD, PhD, recipient of the 2006 American Academy of Orthopaedic Surgeons (AAOS) Diversity Award, compared diversity in orthopaedics with other medical specialties[14]. Orthopaedics was found to be less diverse than all of the other specialties. Considering all minority groups (Hawaiian/Pacific Islander, Native American/Alaskan Native, African American, Hispanic, and Asian), approximately 20% of orthopaedic residents between 2001 and 2008 were URMs[14].

Even more concerning are data from 2 publications showing that African American trainees are increasing at a rate of only 0.68% per decade, and Hispanics trainees are increasing at a rate of 1.4% per decade[14,15]. At this rate, over a 10-year period, <1 African American resident will be added per 100 residency positions (Fig. 1).

What Is the Way Forward for Our Field?

The data on diversity in the orthopaedic profession are sobering and undercut our credibility as leaders in the field of medicine. In 1999, at the Academic Orthopaedic Society Workshop on Diversity in Orthopaedics, Henry Mankin, MD, cited the lack of African Americans, Hispanics, and women in positions of leadership, including membership in prestigious academic societies, service as directors of the American Board of Orthopaedic Surgery (ABOS), and chairs and major leadership roles in orthopaedic departments[16]. He went on to state that it "is the responsibility of the chief of service and the faculty members to change this pattern and offer all individuals equal opportunity and treatment." In a review in the *Journal of the American Academy of Orthopaedic Surgeons,* Dr. Mark Gebhardt indicated that it requires the commitment of the department chair and program director to increase diversity to benefit the orthopaedic profession[17].

Demographic studies of African Americans in the educational system confirm their inability to enter the orthopaedic profession. A study examining African American representation among orthopaedic residents, medical students, college students, and the U.S. population in the years 1968 to 2008 showed a decline at each stage of the educational ladder[14]. In recent years,

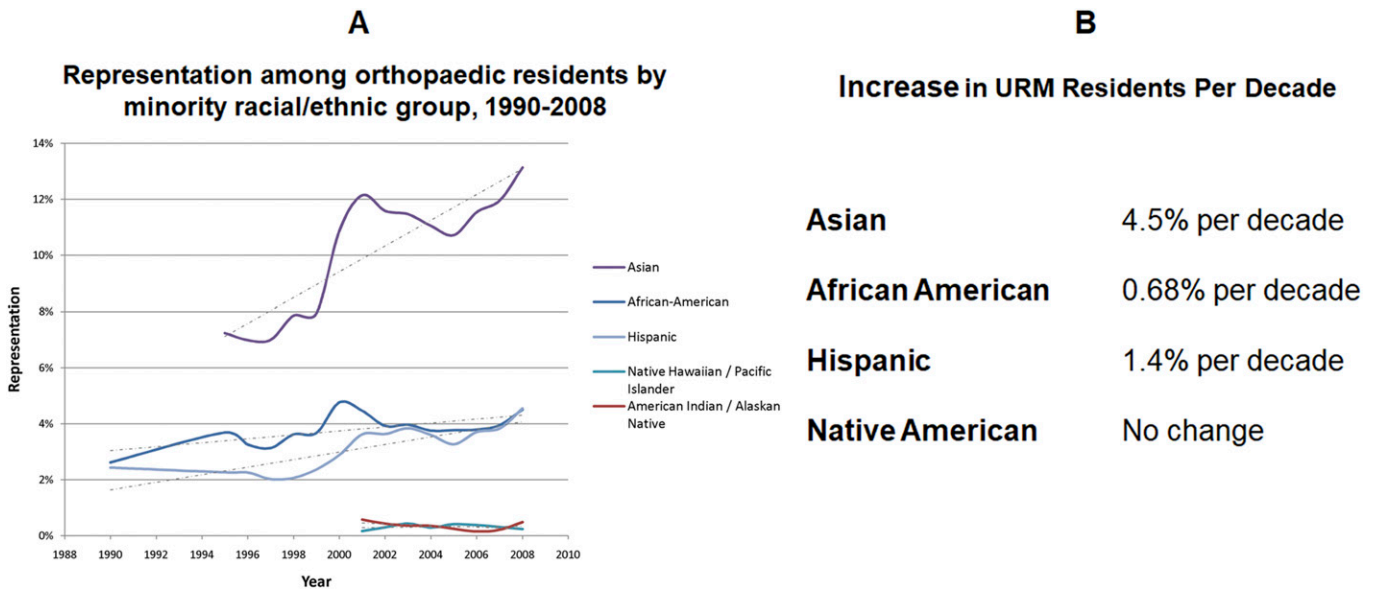

Fig. 1

Figs. 1-A and 1-B Orthopaedic surgery residencies are less diverse than all other residencies, and the number of underrepresented minorities (URMs). URMs entering orthopaedic programs are not increasing at the necessary rate. **Fig. 1-A** There was a limited increase over time in the percentage of residents entering orthopaedic programs from African American, Hispanic/Latino, and Native American/Pacific Islander populations. **Fig. 1-B** The percentage increase over a decade in URM residents who were being trained in orthopaedics. The increase in African American orthopaedics trainees was <1% per decade between 1990 and 2010. (Reproduced from: Okike, Utuk ME, White AA. Racial and ethnic diversity in orthopaedic surgery residency programs. J Bone Joint Surg Am. 2011 Sep 21;93[18]:e107.)

approximately 13% to 14% of college students were African American, a rate slightly higher than the proportion in the U.S. population. However, the proportion of African American medical school matriculants was 7%, and the proportion entering orthopaedic residency was approximately 4%[14].

Thus, change and progress has been limited, and there are reduced opportunities for URMs and women in orthopaedic leadership positions, including those of department chairs and directors of the ABOS. In 2011, the AAOS and the Association of Bone and Joint Surgeons (ABJS) held another joint symposium on diversity in orthopaedics. In his keynote lecture, Louis W. Sullivan, the chair of the influential Sullivan Commission, cited the continued lack of diversity in orthopaedics and implored leaders in our field to embrace and implement change[18]. Dr. Ronald Lindsey has described a sphere of influence whereby leaders in orthopaedics actively engage those around them and create social awareness to promote diversity[19].

At the same time, there is cause for increasing optimism. National awareness and acceptance of equality and the intrinsic rights for people of different races, genders, gender identities, and sexual preferences is increasing. In orthopaedics, the J. Robert Gladden Society and the Ruth Jackson Orthopaedic Society are robust organizations. Both have developed programs designed to increase the pipeline of URMs and women into the field of orthopaedics. Nth Dimensions, led by Dr. Bonnie Simpson, engages URM medical students who are interested in orthopaedics and provides invaluable opportunities for mentoring, research fellowships, and networking. Nth Dimensions' students are sponsored to attend the annual meeting of the AAOS. The Nth Dimensions' orthopaedic match success rate is nearly 80%. Similarly, the Perry Initiative targets high-school-aged women and encourages their engagement in science and allows them to envision a career as an orthopaedic surgeon.

The AOA has a mission to define critical issues facing the field and to work with leaders across our profession to define and implement solutions. The lack of diversity in our profession is among our greatest challenges. In response to this challenge, the AOA has recently revised its strategic plan. The promotion of diversity has been incorporated into each aspect of the strategic plan. The goal is to build a better future for our patients and the communities that we serve. ■

Regis J. O'Keefe, MD, PhD[1]

[1]Department of Orthopaedic Surgery, Washington University School of Medicine, St. Louis, Missouri

E-mail address: okeefer@wustl.edu

ORCID iD for R.J. O'Keefe: 0000-0003-4055-0368

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Update

This article was updated on May 14, 2019, because of a previous error. On page e37(1), in the title of the article, the location that had read "Boston, Massachusetts" now reads "Charlotte, North Carolina."

An erratum has been published: J Bone Joint Surg Am. 2019 Jun 19;101(12):e60.